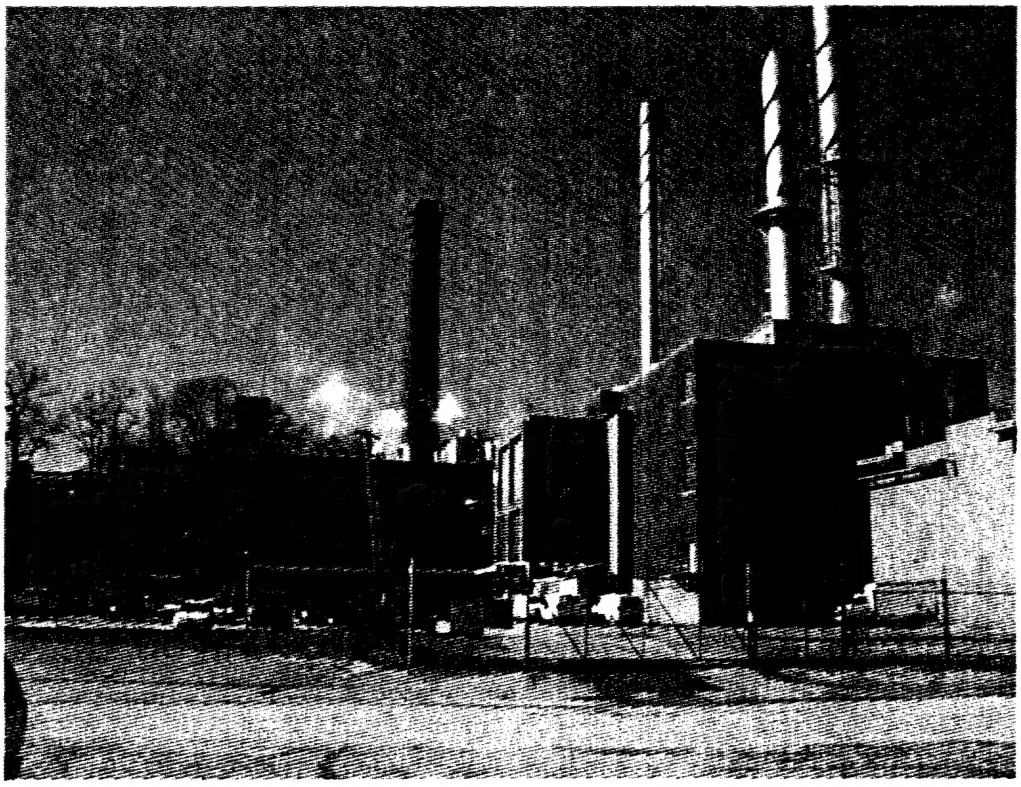
Final
Environmental Assessment
Central Utility Plant
Energy Efficiency Improvement Projects
Public Works Center – Utilities
Great Lakes Naval Training Center
Great Lakes, Illinois



May 2003

DEPARTMENT OF DEFENSE
DEARPTMENT OF THE NAVY

FINDING OF NO SIGNIFICANT IMPACT
FOR CENTRAL UTILITY PLANT
ENERGY EFFICIENCY IMPROVEMENT PROJECTS
GREAT LAKES, ILLINOIS

Pursuant to the Council on Environmental Quality regulations (40 CFR parts 1500-1508) implementing the procedural provisions of the National Environmental Policy Act (NEPA), 42 U.S.C. 4331 *et seq.*, the Department of the Navy gives notice that an Environmental Assessment (EA) has been prepared and that an Environmental Impact Statement (EIS) is not required for the Central Utility Plant energy efficiency projects, Great Lakes, Illinois.

Purpose of and Need for the Proposed Action (s)

The purpose of the proposed action is to improve the efficiency and reliability of the Central Utility Plant, which would include installing electricity producing equipment that would provide NAVSTA Great Lakes with a significant percentage of its electricity needs. Currently, NAVSTA Great Lakes produces steam and is able to supply most of its heating needs; however, the majority of the electricity at NAVSTA Great Lakes is supplied by the local utility. The utility upgrades would reduce energy dependency on the local utility and allow NAVSTA Great Lakes to be more energy self sufficient.

Three (3) of the six (6) boilers currently used to produce steam at NAVSTA Great Lakes were constructed in the 1940's. The efficiencies of purchasing and producing the same energies from separated sources is 63% while taking the combined effect of the proposed technologies is expected to exceed 90%.

Proposed Action

The proposed action includes improving the efficiency and reliability of the central utility plant. Boilers No. 4, No. 5 and No. 6 will continue to operate and produce steam and will be integrated into the proposed central utility plant upgrades. The proposed action includes the following central utility plant upgrades: Installation of two (2) new 5.0 MW simple-cycle combustion turbines; Installation of two (2) new 25.0 MMBtu/hr duct burners for the combustion turbines; Installation of two (2) COGEN selective catalytic reduction units to control NOx

emissions from the combustion turbines and duct burners; Installation of two (2) new 2 MW backup generators that use No. 2 fuel oil; Installation of two (2) new backup generator selective catalytic reduction units; Conversion of three (3) vertical fixed roof tanks from No. 6 fuel oil service to No. 2 fuel oil service; and shutdown and decommission Boilers No.1, No. 2 and No. 3.

Alternatives Considered and Analyzed

There are four reasonable alternatives to the proposed action.

Alternative 1, Install a 10 MW Gas Turbine. The first alternative is to install one (1) X 10 MW gas turbine with a 10 MW backup engine. This alternative does not provide the same redundancy capability as the proposed action. In the event the 10 MW Gas Turbine is shutdown, there would be only one option to produce electricity, i.e. operate the 10 MW Backup engine. The payback for this alternative would also increase.

Alternative 2, Boiler replacement. The second alternative involves replacing older boiler systems including Boiler No. 1, Boiler No. 2 and Boiler No. 3 with new and more energy efficient boiler systems. The initial capital investment versus the energy savings and payback for replacing boiler systems do not make this an economically viable alternative when compared with Alternative One and the proposed action. Payback for this alternative is significantly longer than Alternative One and is nearly double the payback for the proposed action. In addition, this alternative would trigger the major modification thresholds for NOx and carbon monoxide and would be subject to a PSD review, which would be a significant environmental impact.

Alternative 3. The third alternative consists of postponing the proposed construction schedule later in the year or in a later year. Delaying the project later in the year would lengthen the reconstruction time significantly and the project may need to begin in winter, which would further complicate scheduling efforts. Postponing the action until later years may jeopardize the funding available for the project. Other than economic impacts and energy self-sufficiency, impacts resulting from the implementation of this alternative would be comparable to the impacts described for the proposed action.

Alternative 4. The fourth and final alternative is the No Action Alternative consisting of not implementing the proposed central utility plant upgrades. Under this alternative, none of

the activities described for either the proposed action or the reasonable alternatives work would be performed. Implementation of the No Action Alternative would result in no change to the existing central utility plant. NAVSTA Great Lakes would continue to be very dependent on the local utility and electricity costs will be higher than electricity that could potentially be produced on-site.

The No Action Alternative consists of not upgrading the central utility plant. Implementation of the No Action Alternative would result in no cost savings versus electricity usage and an energy savings opportunity would be forfeited. NAVSTA Great Lakes would continue to be very dependent on the local utility for electricity and may be more susceptible to future energy cost increases.

Effects of the Proposed Action

The construction-related activities at the central utility plant would minimally alter the topography at the site as a result of grading, construction, or demolition activities. Most of the construction associated with the proposed action will occur inside the central utility plant (Building 11).

Potential air quality impacts resulting from the proposed action include air emissions generated from the construction activities and associated construction vehicles in the Metropolitan Chicago Interstate (Illinois-Indiana) Air Quality Control Region (AQCR), which is classified as a severe *non-attainment* area for ozone. Potential air quality impacts resulting from the proposed action also include air emissions generated from the operation of the two (2) X 5.0 MW combustion turbines and supporting equipment. Emissions generated from the proposed energy production equipment include carbon monoxide, sulfur dioxide, nitrogen oxide, PM-10 and volatile organic material. NSR/PSD applicability determinations were conducted for each of the referenced criteria pollutants. Based on consultant studies, emissions from the proposed action for each criteria pollutant were below thresholds that would trigger NSR/PSD requirements.

An applicability analysis was performed to determine whether a formal conformity determination would be required. A record of non-applicability for Clean Air Act Conformity was prepared for the proposed action. For volatile organic compounds, emissions from the proposed action would not equal or exceed any of the rates established in 40 CFR 93.153(b)(1). Consequently, a conformity determination is not required for volatile organic

compounds. Naval Station Great Lakes is located in an area that is in attainment for carbon monoxide, sulfur dioxide, PM-10 and lead, which are pollutants for which a conformity determination could be required; however, because Naval Station Great Lakes is in attainment for these criteria pollutants, a conformity determination is not required for these criteria pollutants. The Environmental Protection Agency (EPA) has granted an exemption, pursuant to Section 182(f)(3) of the CAA, from the general conformity requirements for NOx_x within the Lake Michigan Ozone Study modeling domain, which includes portions of the states of Illinois, Indiana, Michigan, and Wisconsin. However, NOx computations were included in the analysis.

Potential sound quality impacts resulting from the proposed action include sound generated from operating the combustion turbines and diesel fired backup generator. For the combustion turbines, sound levels would be below Noise Criteria (NC) curves of 30 and 35. NC curves ranging from 30 to 35 represent the sound level for office space, which is an occupancy type. Listening conditions for sound levels between NC curves of 30 and 35 are defined as good. Although sound levels generated from operating the diesel fired backup generator are above NC curves of 30 and 35, it is anticipated that the backup generator will represent only 3% of the total central utility plant operation. In addition, the backup generators would operate at sound levels only two (2) dB above the NC curve of 35, which is acceptable under NAVFAC. It should also be noted that the central utility plant is an existing facility and sound levels have always been elevated in this area. For these reasons, no significant impacts related to sound are anticipated for the proposed action alternative.

Asbestos abatement efforts would be required for the proposed action. Based on asbestos inspection reports, asbestos containing materials have been identified. An asbestos abatement plan will be prepared for any asbestos abatement actions and all asbestos abatement work shall comply with all applicable standards including RCRA. Waste management procedures must be followed with appropriate "cradle to grave" recordkeeping and tracking. These asbestos abatement efforts will be an isolated or "one time" event and no adverse impacts are anticipated for the proposed action.

Additionally, no significant impacts to the community setting, land use, population, demographics, area economics, public services (potable water supply, stormwater), transportation, recreation, wildlife, threatened and endangered species are

anticipated. No disproportionately high and adverse human health or environmental effects specific to any group or individual from minority or low-income populations, or children residing in the study are anticipated.

Building 11 contributes to the Great Lakes Naval Training Station, which was listed on the National Register of Historic Places. We received a letter from the Illinois Historic Preservation Agency that concurred with NAVSTA Great Lakes that the proposed action would have no adverse effect on the historic property. Specifically, potential impacts of the project include plans to install a roll-up door in Building 11. The new roll-up door would be 24' high X 9.5', which would be used to convey energy production equipment. It is important to understand that Building 11 has historically been used for energy production and the proposed actions are consistent with the building's historical use.

Based on information gathered during the preparation of, and presented within the EA, the Navy finds that the implementation of the proposed action will not significantly impact the environment. The Proposed Action construction would minimally affect topography, geology, vegetation, process wastewater, waste material generation and EPCRA requirements. Further investigations indicate that the proposed actions would not have an adverse affect on air resources, sound and cultural resources.

Plan of action is to start upgrading the central utility plant in July 2003.

The EA addressing this action may be obtained from: Commanding Officer, Naval Station, 201 Decatur Ave, Bldg 1A, Great Lakes, Illinois 60088-2801 (Attn: Mr. William Busko, Code N453) telephone (847) 688-5999, extension 154, email buskowa@efdsouth.navfac.navy.mil. A limited number of copies of the EA are available to fill single copy requests.

9 July 2003
Date

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A LIST OF ABBREVATIONS AND ACRONYMS

ACM	- ASBESTOS CONTAINING MATERIAL
AQCR	- AIR QUALITY CONTROL REGION
AQR	- AIR QUALITY REGION
ASHAE	- AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR CONDITIONING ENGINEER'S
BMP	- BEST MANAGEMENT PRACTICE
BTEX	- BENZENE, TOLUENE, ETHYL BENZENE, XYLENE
CAA	- CLEAN AIR ACT
CEQ	- COUNCIL ON ENVIRONMENTAL QUALITY
CERCLA	- COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION AND LIABILITY ACT
cm	- CENTIMETER
CO	- CARBON MONOXIDE
COGEN	- COGENERATION
CZM	- COASTAL ZONE MANAGEMENT
dB	- DECIBEL
DCD	- DISCHARGE CONTROL DOCUMENT
EA	- ENVIRONMENTAL ASSESSMENT
EPA	- ENVIRONMENTAL PROTECTION AGENCY
EPCRA	- EMERGENCY PLANNING COMMUNITY RIGHT-TO-KNOW ACT
FEPCA	- FEDERAL ENVIRONMENTAL PESTICIDE CONTROL ACT
FIFRA	- FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT
GLPD	- GREAT LAKES POLICE DEPARTMENT
ha	- HECTARE'S
HRSG	- HEAT RECOVERY STEAM GENERATOR
IAS	- INITIAL ASSESSMENT STUDY
IDNR	- ILLINOIS DEPARTMENT OF NATURAL RESOURCES
IESPB	- ILLINOIS ENDANGERED SPECIE PROTECTION BOARD
IHPA	- ILLINOIS HISTORIC PRESERVATION AGENCY
INRMP	- INTEGRATED NATURAL RESOURCE MANAGEMENT PLAN
IRP	- INSTALLATION RESTORATION PROGRAM
LEPC	- LOCAL EMERGENCY PLANNING COMMITTEE
LQG	- LARGE QUANTITY GENERATOR
m	- METERS
MABAS	- MUTUAL AID BOX ALARM SYSTEM
MMBTU/HR	- 1,000,000 BRITISH THERMAL UNITS PER HOUR
MOU	- MEMORANDUM OF UNDERSTANDING
MW	- MEGAWATT
NAAQS	- NATIONAL AMBIENT AIR QUALITY STANDARDS
NACIP	- NAVY ASSESSMENT AND CONTROL OF INSTALLATION POLLUTANTS

NAVFAC	- NAVAL FACILITIES
NC	- NOISE CRITERIA
NECA	- NAVY ENVIRONMENTAL COMPLIANCE ACCOUNT
NEPA	- NATIONAL ENVIRONMENTAL POLICY ACT
NGVD	- NATIONAL GEODETIC VERTICAL DATUM
NIOSH	- NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH
NOX	- NITROGEN OXIDE
NPDES	- NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
NRCS	- NATURAL RESOURCES COUSERVATION SERVICE
NRHP	- NATIONAL REGISTER OF HISTORIC PLACES
NSR	- NEW SOURCE REVIEW
NTC	- NAVAL TRAINING CENTER
OPA	- OIL POLLUTION ACT
OPNAVINST	- OFFICE OF THE CHIEF OF NAVAL OPERATIONS INSTRUCTION
OSHA	- OCCUPATIONAL SAFETY AND HEALTH ACT
PM10	- PARTICULATE MATTER
PSD	- PREVEUTION OF SIGNIFICANT DETERIORATION
PWC	- PUBLIC WORKS CENTER
RCRA	- RESOURCE CONSERVATION AND RECOVERY ACT
RTC	- RECRUIT TRAINING COMMAND
SARA	- SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT
SCR	- SELECTIVE CATALYTIC REDUCTION UNIT
SCS	- SOIL CONSERVATION SERVICE
SERC	- STATE EMERGENCY RESPONSE COMMISSION
SHPO	- STATE HISTORIC PRESERVATION OFFICER
SIP	- STATE IMPLEMENTATION PLAN
SMC	- STORMWATER MANAGEMENT COMMISSION
SO2	- SULFUR DIOXIDE
SWPPP	- STORMWATER POLLUTION PREVENTION PLAN
TSCA	- TOXIC SUBSTANCE CONTROL ACT
USACE	- UNITED STATES ARMY CORPS OF ENGINEERS
USC	- UNITED STATES CODE
USDA	- UNITED STATES DEPARTMENT OF AGRICULTURE
USFWS	- U.S. FISH AND WILDLIFE SERVICE
USGS	- UNITED STATES GEOLOGICAL SURVEY
VOM	- VOLATILE ORGANIC MATERIAL
WDO	- WATERSHED DEVELOPMENT ORDINANCE

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APPENDICES

1.0 PURPOSE OF AND NEED FOR ACTION

1.1 INTRODUCTION

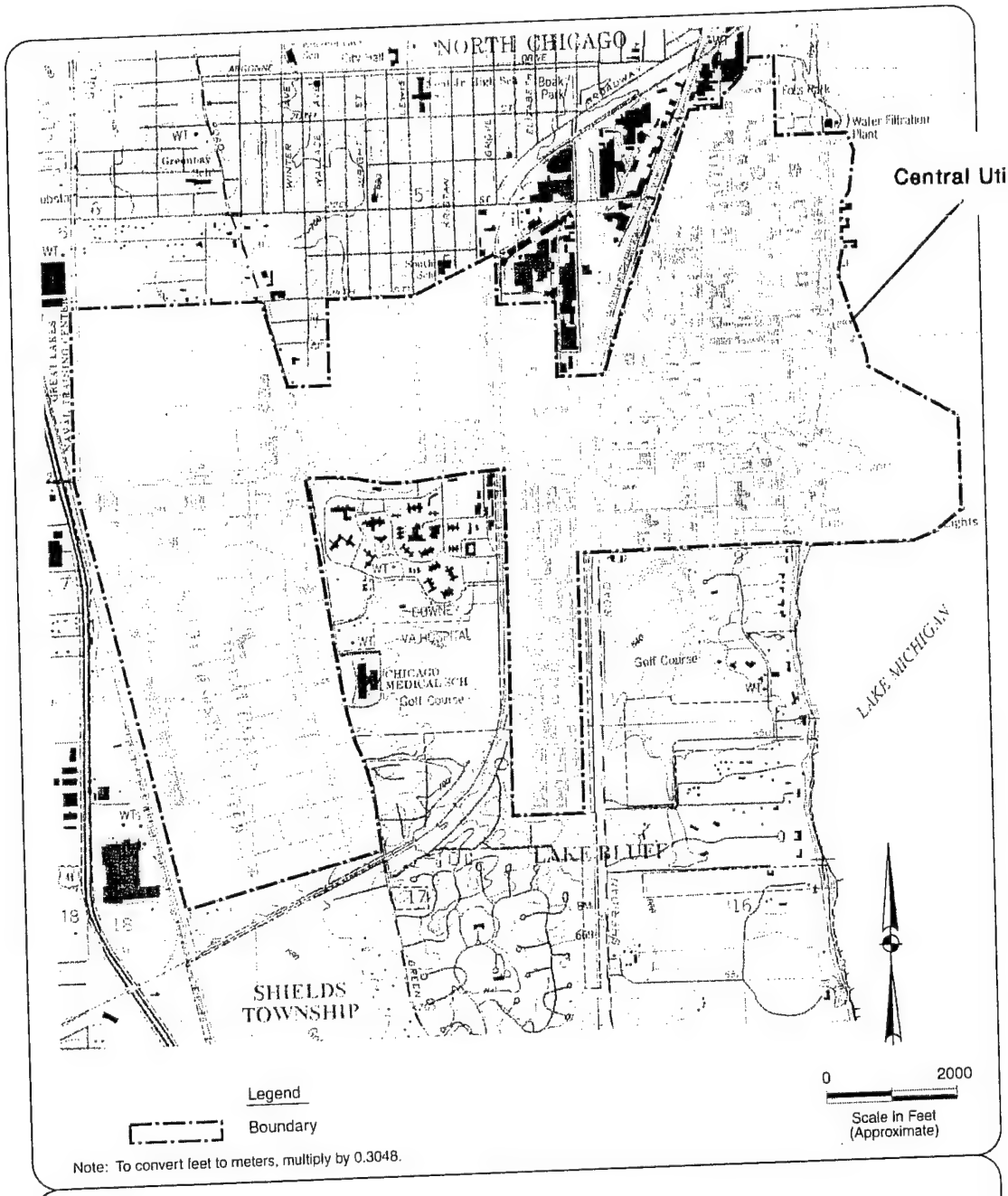
Naval Station, Great Lakes (NAVSTA Great Lakes) is located in Lake County, Illinois, in the northeastern portion of the state on 1,628 acres within the municipality of North Chicago, Illinois (*Figure 1*). The installation is approximately 45 miles north of the central business district of Chicago and 65 miles south of Milwaukee, Wisconsin. NAVSTA Great Lakes is bordered by Lake Michigan to the east, industrial, residential and public recreational areas to the north, public utility corridor and commercial and residential areas to the west, and residential areas to the south. NAVSTA Great Lakes is the only recruit (basic) training location for the Navy. Its mission is to provide the fleet with well-trained, well-schooled sailors. To meet its Navy support mission, NAVSTA Great Lakes is home to three major commands with training responsibilities: Enlisted Training Command, Training Support Command, and Hospital Corps School (U.S. Navy, 2003d).

The central utility plant provides steam and electricity to NAVSTA Great Lakes. The central utility plant is located at the NAVSTA Great Lakes north of Buckley Road (Route 137) and east of Green Bay Road (Route 131). The location of central utility plant is shown on *Figure 1 and in Appendix A*. The central utility plant is identified as Building 11, which is located just west of Lake Michigan and in Section 4, Township 44N, Range 12E on the Waukegan 7.5-minute topographic map.

1.2 PURPOSE OF AND NEED FOR THE ACTION

The purpose of the proposed action is to improve the efficiency and reliability of the central utility plant, by installing electricity producing equipment that would provide NAVSTA Great Lakes with a significant percentage of its electricity needs. Currently, the boiler systems at NAVSTA Great Lakes produce steam and provide the majority of NAVSTA Great Lakes' heating requirements. Excess steam is used to produce electricity; however, these operations produce only a small percentage of NAVSTA Great Lakes' electricity needs. The utility upgrades would reduce energy dependency on the local utility and allow NAVSTA Great Lakes to be more energy self-sufficient.

Currently, six (6) boilers are used to supply steam to NAVSTA Great Lakes. Boilers No. 1, No.2 and No. 3 are rated at about 60 million British thermal units per hour (MMBtu/hr) and were constructed in the 1940's. These boilers will be decommissioned as part of the Cogeneration and Fuel Oil Conversion project. Boilers No. 4, No. 5 and No. 6 are rated at 120 MMBtu/hr, 340 MMBtu/hr and 340 MMBtu/hr respectively. Boiler No. 4 was constructed in the 1950's while boilers No. 5 and boiler No.6 were constructed in 1966. As a by-product, electricity is produced using steam from the boilers to power 2 X 1.5-megawatt steam turbine generators.



Note: To convert feet to meters, multiply by 0.3048.

Figure 1 Main Installation Site Map

This Environmental Assessment (EA) has been prepared in accordance with the National Environmental Policy Act (NEPA), Council on Environmental Quality's (CEQ) regulations, as implemented by the Department of the Navy's Environmental and Natural Resources Program Manual (OPNAVINST 5090.1B, Change 2). This document provides the decision-maker with information needed to understand the future environmental consequences that could result from the implementation of the proposed action and to mitigate any such consequences.

2.0 ALTERNATIVES

This section describes the project alternatives, the no action alternative and postponing the action alternative. These alternatives will be assessed throughout the Environmental Impacts Section (Section 4.0) and compared to the proposed action in the Comparison of Environmental Impacts Section (Section 5.0).

2.1 DESCRIPTION OF THE PROPOSED ACTION

The majority of demolition and construction work associated with this project will occur inside the central utility plant or Building 11. Inside the building, three boilers will be permanently decommissioned. In lieu of these three (3) boilers, there are three energy producing alternatives including the installation of two (2) X 5.0 MW combustion turbines (Alternative One), one (1) X 10 MW combustion turbine (Alternative Two) or replacing the older boiler systems with more energy efficient boiler systems (Alternative Three). The combustion turbines will also include the installation of duct burners, selective catalytic reduction units and boiler systems; however, there will be some outside construction and nominal excavation associated with installing combustion turbines.

Several new outside structures would be constructed for combustion turbine or Alternative One and Alternative Two installations. New outside construction for the proposed combustion turbine projects include the installation of the following structures/equipment (Exelon Federal Services Group, October, 2002):

1.) An aqueous Ammonia station tank on a concrete pad with concrete dike;
2.) Natural Gas Compressor Station on concrete pad;
3.) Aqueous Ammonia Pump Enclosure;
4.) Backup generators on concrete pads;
5.) Transformer;
6.) Switchgear.

The proposed action includes improving the efficiency and reliability of the central utility plant. Currently, six (6) boilers are used to supply steam to NAVSTA Great Lakes. Boilers No. 1, No.2 and No. 3 are rated at about 60 million British thermal units per hour (MMBtu/hr) and were constructed in the 1940's. These boilers will be decommissioned as part of the Cogeneration and Fuel Oil Conversion project. Boilers No. 4, No. 5 and No. 6 are rated at 120 MMBtu/hr, 340 MMBtu/hr and 340 MMBtu/hr respectively. Boiler No. 4 was constructed in the 1950's while boiler No. 5 and boiler No.6 were constructed in 1966. As a by-product, electricity is produced using steam from the boilers to power 2 X 1.5-megawatt steam turbine generators (U.S. Navy, 2003a).

The proposed alternatives offer advantages in efficiency over the current technologies. By upgrading the central utility plant, efficiencies would be expected to increase significantly. For the proposed project, the energy input is fuel and the outputs are electricity and steam used to heat buildings. The electricity is generated by gas

turbines and steam is generated by recovering the heat from the turbines. The existing conventional technologies are to purchase power from public utilities and produce steam from in-house boilers. The newer technologies are expected to increase efficiencies significantly over the current technologies (U.S. Navy, 2003b).

2.1.1 Alternative One (1) involves improving the existing energy systems and would include the following efforts. (The improvements included in the proposed action are also shown on *Figure 2):*

- The installation of two (2) new 5.0 MW simple-cycle combustion turbines (Exelon Federal Services Group, November 2002),
- The installation of two (2) new 25.0 MMBtu/hr duct burners for the combustion turbines,
- The installation of two (2) COGEN selective catalytic reduction units to control NOx emissions from the combustion turbines and duct burners,
- The installation of two (2) new 2 MW backup generators that use No. 2 fuel oil,
- The installation of two (2) new backup generator selective catalytic reduction units,
- The conversion of three (3) vertical fixed roof tanks from No. 6 fuel oil service to No. 2 fuel oil service,
- The shutdown and decommissioning of Boilers No.1, No. 2 and No. 3.

2.1.2 Alternative Two (2) is very similar in scope to Alternative one (1); however, only one (1) X 10 MW gas turbine and one (1) X 10MW backup engine would be installed in lieu of two (2) X 5 MW gas turbines and two (2) X 2 MW backup generators.

2.1.3 Alternative Three (3) involves Boiler Replacement. Three (3) of the oldest existing boiler systems would be replaced with two (2) new and more energy efficient boiler systems. The two (2) "new" boiler systems would have the same output as the current boilers; however, energy requirements would be considerably lower to operate the new boiler systems. Alternative Three would not be implemented to produce and supply significant amounts of electricity for NAVSTA Great Lakes.

2.1.4 Alternative No. 4 is the Postponing Alternative. Postponing the action would delay the proposed construction schedule later in the year or in a later year.

2.1.5 Alternative No. 5 is the no action alternative. The No Action Alternative does not implement the proposed central utility plant improvements. Under this alternative, none of the proposed activities described for the alternatives would be performed. Implementation of the No Action Alternative would result in no change to existing condition or operation of the central utility plant.

2.1.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

There are various technologies that can be used to upgrade the central utility plant and increase electricity production. Two (2) such options include:

a.) Installing a 4MW gas turbine and no back-up generator.
b.) Installing a 10MW gas turbine with 10MW back-up engine and lower steam production to 125 pounds.

Installing a 4MW gas turbine with no backup is more expensive to operate than installing a gas turbine with backup. Gas turbines need to be serviced periodically and would be shutdown during maintenance activities. During shutdown, more energy would need to be purchased from the local utility. Significant jumps in energy needs result in significant cost increases and capital costs of installing a back-up unit are ultimately less than the costs of requiring a significant energy load for an intermittent time period.

Installing a 10MW gas turbine with 10MW backup engine and lowered steam production (not using existing steam turbines) is more expensive than not lowering steam production, i.e. operating the existing steam turbines. Although it is cheaper to operate at 125 pounds of steam, the thermal cycle is more efficient with the steam turbines operating.

FIGURE 2

ALTERNATIVE ONE (1) FOR THE COGEN PROJECT

Emission Units	Description of Process Change(s)
Simple-Cycle Combustion Turbines (GTG-1, GTG-2)	Two new 5.0 MW simple-cycle combustion turbines would be installed. Turbines would supply steam and heat to NAVSTA Great Lakes, and would have natural gas and No. 2 fuel oil firing capabilities.
Duct Burners (DB1-1, DB-2)	One new duct burner would be installed downstream from each combustion turbine to provide supplementary heat for the HRSGs, which in turn would recover heat from the exhaust gases. These duct burners would be rated at 25.0 MMBtu/hr and would have natural gas and No.2 fuel oil firing capabilities.
Cogen Selective Catalytic Reduction Units (SCR-1, SCR-2)	One new SCR would be installed downstream of each HRSG to control NOx emissions from the combustion turbines and duct burners. Exhaust gases from both the combustion turbines and the duct burners would be routed through the SCR's.
Diesel-Fired Backup Generators (G-1, G-2)	Two new 2 MW backup generators would be installed. The backup generators would be No.2 fuel oil fired.
Backup Generator Selective Catalytic Reduction Units (GSCR-1, GSCR-2)	One new SCR would be installed downstream of each backup generator to control NOx emissions.
No. 2 Fuel Oil Storage Tanks (11-E, 11-K, 11-L)	Three vertical fixed roof tanks would be converted from No. 6 fuel oil service to No. 2 fuel oil service.
Boilers (No. 1, No. 2, No. 3)	Boilers No. 1, No. 2 and No. 3 would be permanently shutdown and decommissioned prior to the installation of the cogen. The cogen would be built in the footprint of these three boilers.

3.0 AFFECTED ENVIRONMENT

This section contains a description of the affected environment surrounding the central utility plant. This section provides information to serve as a baseline from which to identify and evaluate environmental consequences resulting from the proposed action. Surrounding areas and buildings of the proposed action areas are shown in *Appendix A*. Photographs of Building 11, the areas surrounding the proposed action areas or Building 11 and existing boiler systems are contained in *Appendix B*. Evaluations of the existing environment are presented in three major categories, which represent the major environmental components of the area: the natural environment, the man-made environment, and socioeconomic conditions.

3.1 NATURAL ENVIRONMENT

NAVSTA Great Lakes is located in Lake County, Illinois, in the northeastern portion of the state on 1,628 acres within the City of North Chicago. The installation is approximately 45 miles north of the central business district of Chicago and 65 miles south of Milwaukee, Wisconsin. NAVSTA Great Lakes is bordered by Lake Michigan to the east, industrial areas of North Chicago to the north, residential areas of Lake Bluff to the south, and unincorporated Shields Township to the west.

The proposed project areas, which will be located in Building 11 and surrounding areas, are part of NAVSTA Great Lakes and are located at the east end of the installation near Lake Michigan. The central utility plant is located in Building 11 and generates steam and electricity for NAVSTA Great Lakes usage. Building 11 is located at the NAVSTA Great Lakes on the north side of Buckley Road (Route 137) near Lake Michigan, and its location is shown on *Figure 1 and in Appendix A*.

3.1.1 EARTH RESOURCES

3.1.1.1 Topography

Lake County is located on the Wheaton Morainal Complex of the Great Lakes Section of the Central Lowland Physiographic Province (U.S. Navy, 2002a). NAVSTA Great Lakes is located in Sections 4, 5, 8 and 9, Township 44N, Range 12E on the Waukegan 7.5-minute topographic maps (U.S. Geological Survey [USGS], 1993). NAVSTA Great Lakes is located within the Bluff-Ravine Complex characterized by level land bordered by steep bluffs facing the shore of Lake Michigan and a network of interior ravines. The eastern boundary of NAVSTA Great Lakes is a sand beach along the shore of Lake Michigan.

The central utility plant is located near the western shore of Lake Michigan at an elevation of approximately 580 feet (177 meters [m]) NGVD. There are steep bluffs behind the central utility plant that reach elevations of approximately 650 feet (198 m) NGVD.

3.1.1.2 Geology and Soils

Lake County is located in the Wheaton Morainal Complex of the Great Lakes Section of the Central Lowland Province. The NAVSTA Great Lakes is a part of the Bluff-Ravine sub-complex, characterized by level lands that are bordered by steep bluffs that face Lake Michigan and a network of interior ravines.

The geology of Lake County is described as unconsolidated glacial till overlying Silurian age dolomite (U.S. Navy, 1998a). The most recent period of glaciation is primarily responsible for present-day landforms (USDA, 1970). The unconsolidated glacial deposits range in thickness from 100 to 300 feet (30.5 to 91.4 m). A generalized geologic description from ground surface to bedrock is 100 to 150 feet (30.5 to 45.7 m) of fine-grained till underlain by 10 to 50 feet (3.0 to 15.2 m) of sand and gravel. The sand and gravel is underlain by 10 to 50 feet (3.0 to 15.2 m) of fine-grained till, which is positioned over Silurian-age dolomitic bedrock (U.S. Navy, 1998d).

The dominant soil type at the central utility plant is beach sand (USDA, 1970). Beach sand consists of sand and water-rounded stones and occurs along the entire shoreline of lake Michigan. The beach sand area is narrow and irregular south of Waukegan and below the bluffs (U.S. Navy, 1990). During high water periods, the Lake Michigan bluffs erode at a rate estimated at 5 feet (1.5 m) per year. There are no piers or groins in the beach areas near the central utility plant. In the winter or during a storm, large amounts of sand are reworked and carried southward by shore currents, altering the configuration of the existing well-defined beaches. Beach sand is suitable only for recreational use (USDA, 1970).

3.1.1.3 Climate

The climate of the region is continental, with warm summers and cold winters. Prolonged warm spells and major droughts are infrequent, but long spells of dry weather may occur during the growing season. The region is characterized by frequent changes in temperature, humidity, cloudiness, and wind direction. The main variation in the local climate pattern is caused by Lake Michigan. The prevailing wind direction has a westerly component in all months except May, when the prevailing wind shifts to north-northeasterly.

Total precipitation averages slightly more than 34 inches per year, including snowfall and rainfall amounts. Over half of this precipitation falls during the 155 day growing season from May through September. Thunderstorms are frequent from May to early July and are occasionally accompanied by high winds and hail or tornadoes. Average snowfall is 39 inches per year, most of which falls in the period from December to March.

3.1.1.4 Air Resources

The project area is located in the Metropolitan Chicago Interstate (Illinois-Indiana) Air Quality Control Region (AQCR). The Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone due to the recorded exceedances of the National Ambient Air Quality Standards (NAAQS) for ozone (1-hour per day reading of greater than 0.12 parts per million [ppm]). The current standard for ozone is 0.08 ppm for an 8-hour period. *Table 1* presents the NAAQS for the region. All other criteria pollutants (carbon monoxide, lead, nitrogen dioxide, particulate matter to 10 microns or smaller, and sulfur dioxide) are in compliance with the standards. The closest air-monitoring station to NAVSTA Great Lakes is located in Waukegan, Illinois. During 2001, this station recorded a 1-hour high of 0.105 ppm for ozone, and an 8-hour high of 0.095 ppm (Illinois EPA, January 2002).

The Environmental Protection Agency (EPA) has published final rules on general conformity that apply to federal actions in areas designated *non-attainment* for any of the criteria pollutants under the Clean Air Act (CAA). The Metropolitan Chicago Interstate Air Quality Control Region (AQR) is classified as a severe non-attainment area for ozone. Under 40 CFR 93.153, a conformity determination is required for each pollutant where the total of direct and indirect emissions in a nonattainment area caused by a Federal action would equal or exceed any of the rates contained in this section.

NAVSTA Great Lakes is an existing major source of VOM, NOx, CO, PM10 and SO2. The Chicago area has attainment designations for NOx, CO, PM10 and SO2 and, therefore, is subject to Prevention of Significant Deterioration (PSD) federal rules (40 CFR 52.21). Because the Chicago area is a designated severe ozone nonattainment area for ozone as per 40 CFR Part 81, a New Source Review (NSR) program applicability determination is required for VOM (according to Illinois NSR rules found in 35 IAC 203), which is a precursor to ozone formation in the atmosphere. While NOx is also a precursor to ozone formation, the Chicago ozone nonattainment area has been granted a Federal Clean Air Act 182(f) waiver for NOx. Consequently, NOx emissions fall under PSD procedures instead of NSR review procedures.

TABLE 1
Summary Of National And Illinois Ambient Air Quality Standards
Illinois Air Quality Report 2000

Pollutant	Averaging Time	Primary Standard	Secondary Standard
Particulate Matter < 10 microns	Annual Arithmetic Mean	50 $\mu g/m^3$	Same as Primary
	24-hour	150 $\mu g/m^3$	Same as Primary
Particulate Matter < 2.5 microns	Annual Arithmetic Mean	15.0 $\mu g/m^3$	Same as Primary
	24-hour	65 $\mu g/m^3$	Same as Primary
Sulfur Dioxide	Annual Arithmetic Mean	0.03 ppm	None
	24-hour	0.14 ppm	None
	3-hour	None	0.5 ppm
Carbon Monoxide	1-hour	35 ppm	Same as Primary
	8-hour	9 ppm	Same as Primary
Ozone	1-hour/day	0.12 ppm	Same as Primary
	8-hour/day	0.08 ppm	Same as Primary
Nitrogen Dioxide	Annual Arithmetic Mean	0.053 ppm	Same as Primary
Lead	Quarterly Arithmetic Mean	1.5 $\mu g/m^3$	Same as Primary

Note: Standard units are parts per million (ppm) or micrograms per cubic meter ($\mu g/m^3$)

3.1.1.5 Sound Environment

Land use surrounding the central utility plant consists of training and support facilities, recreational areas, maintained open areas and natural areas. Land use immediately surrounding the central utility plant consists of the undeveloped panne wetland and dune areas to the southwest, Lake Michigan to the east and a naturally vegetated incline slope to the immediate west.

The decibel (dB) scale is used to quantify sound intensity. Since the human ear is not equally sensitive to all frequencies within the entire spectrum, measurements for sound are generally weighted heavily within those frequencies of maximum human sensitivity in a process called "A-weighing" (expressed as dBA). Additionally, sound sources typically are not constant. Sound levels vary in frequency and their intensity fluctuates over time; therefore, a day-night equivalent sound level, expressed as "Leq," is used to express a single number to describe varying sound levels over a period of time.

Sound levels along the lakefront are typically associated with natural phenomena such as wind and wave activity and avian wildlife. Occasional automobile and boat traffic and related human activities also can add to ambient sound levels. Daily sound levels associated with these variables can range from 60 to 70 dBA, depending on the intensity and duration; however, during storm events, sound levels could increase to 75 to 80 dBA or more. Sound levels near the various commercial areas, industrial areas and rail-lines generally range from 60 to 80 dBA or more (U.S. Navy, 2001g).

3.1.2 BIOLOGICAL ENVIRONMENT

3.1.2.1 Vegetation

Historically, the plant communities found in Lake County consisted of forested areas of oak, elm, hickory, maple, and other hardwoods. The vegetation in the area now occupied by NAVSTA Great Lakes would have included areas of this forest community. Dominant tree species in developed areas now include cottonwood (*Populus deltoids*), honey locust (*Gleditsia triacanthos*), white oak (*Quercus alba*), red oak (*Quercus falcate*), sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), butternut (*Juglans cinesea*), common buckthorn (*Rhamnus cathartica*), glossy buckthorn (*Rhamnus frangula*) and spruce (*Picea*). One hundred forty six (146) plant species were identified on or near the beach area during a May-September 1995 Survey. Development and associated landscaping has displaced nearly all of the original vegetative communities. Introduced species and a variety of ornamental shrubs and trees dominate the vegetation at NAVSTA Great Lakes. Herbaceous vegetation consists of turf grasses and is mowed regularly.

Several nature preserves are located in Lake County north of the NAVSTA Great Lakes and adjacent to Lake Michigan. The most significant preserve adjacent to the NAVSTA Great Lakes is the Illinois Beach State Park, which is a preserve for the shoreline plant community normally associated with sand dunes. This state preserve encompasses over 2,500 acres. Other nearby preserves include Van Patten Woods, Waukegan Savannah, and Lynn Woods. In all, Lake County possesses over 24,000 acres of forest preserve.

Lake Michigan shoreline is located just east of the central utility plant and is characterized by beach habitat. Beach habitat near the central utility plant is mostly unvegetated sands. Plant communities in and near these beach areas include a sand dune community, a panne wetland and a lakefront wetland.

3.1.2.2 Wildlife

The native wildlife populations of eastern Lake County have been largely displaced by developmental pressures, pollution, and corresponding loss of habitat. Species adaptable to living in close proximity to human development are occasionally observed. These animals still common in the county include white tailed deer, skunk, raccoon, coyote, gray and fox squirrels, red and gray fox, opossum, weasel, woodchuck,

cottontail rabbit, four mouse species and meadow vole. Game birds include ring-necked pheasant, dove, woodcock, and a small population of Hungarian partridge. Waterfowl include Canadian geese, mallard ducks, wood ducks, coots and others. Game fish in the county consist of large mouth bass, bluegill, northern pike, white bass, croppies, walleyed pike and Coho and Chinook salmon. A more comprehensive delineation of wildlife species such as aquatic, reptiles, amphibians, birds and mammals at NAVSTA Great Lakes is described below.

Aquatic

The outer harbor, which is near the central utility plant, provides a variety of habitats for several species of fish. The rock jetties and groins of the harbor and along the beaches provide conditions suitable for rock bass (*Ambloplites rupestris*), Lakeshore and nearshore waters are suitable for white crappie (*Pomoxis annularis*), lake whitefish (*Coregonus clupeaformis*), northern pike (*Esox lucius*), rainbow smelt (*Osmerus mordax*), and yellow perch (*Perca flavescens*). Fish surveys conducted in 1983, 1984 and 1986 documented twenty species of fish within the harbors of NAVSTA Great Lakes (Table 3-1).

Reptiles and Amphibians

No amphibians or reptiles have been found within Pettibone Ravine, on bluffs or in wetlands of the lakeshore based on recent fauna surveys at NAVSTA Great Lakes, although potential habitat for these species is present. Based on known distributions and vegetation types, species of amphibians and reptiles that may occur on NAVSTA Great Lakes include snapping turtles (*Chelydras serpentina*), musk turtle (*Sternotherus odoratus*), Eastern plains garter snake (*Thamnophis radix*), fox snake (*Elaphe vulpina*), Eastern hognose snake (*Heterodon platyrhinos*), Eastern tiger salamander (*Ambystoma tigrinum tigrinum*), Fowler's toad (*Bufo woodhousei fowleri*), Western chorus frog (*Pseudacris triseriata triseriata*), and green frog (*Rana clamitans melanota*) (U.S. Navy, 2000a and 1995).

Birds

Many species of resident and migratory birds make use of the lake bluffs and the beaches of Lake Michigan that are near the central utility plant. Recent bird surveys at NAVSTA Great Lakes documented 34 species of breeding birds and 100 species of migratory birds. *Table 3-2* presents those species that are indicated to inhabit or nest on beaches or lakeshore wetlands. Some of the species listed as migratory may in fact be resident year-round on NAVSTA Great Lakes, but most species appear to use ravines, lake bluffs and beaches for resting and feeding during migrations.

The beaches and lakeshore wetlands of NAVSTA Great Lakes provide valuable nesting and foraging habitat for species of wading and shorebirds. Spotted Sandpipers (*Actitis macularia*), Killdeer (*Charadrius vociferous*) and Common Terns (*Sterna hirundo*) use beaches and unvegetated sands for nesting and foraging, and are known to breed on

NAVSTA Great Lakes. Forster's Tern (*Sterna forsteri*), Common Snipes (*Gallinago gallinago*), Great Blue Herons (*Ardea herodias*) and Black-crowned Night Herons (*Nycticocorax nycticocorax*) are known to nest in pannes and other lakeshore wetlands such as those on NAVSTA Great Lakes, but also use beaches for foraging. Several migratory species use beaches and lakeshore wetlands near the central utility plant during their spring and fall migrations (*Table 3-2*), and are known to frequent NAVSTA Great Lakes. The majority of breeding species are extremely common in the Chicago area, tolerant of human activities and able to survive in a landscape affected by human activity. The limited number of breeding species in the area is a reflection of the limited amount of native vegetation resembling pre-settlement plant communities.

The eastern end of the beach and wetlands along the north jetty of Outer Harbor at NAVSTA Great Lakes is managed as a bird sanctuary. *Figure 3 (a, b and c)* presents photographs of the sensitive habitats in this area. Initial attempts in June 2000 to monitor the site for bird activities indicated a colony of Common Terns, state-listed as endangered, nested in the sanctuary. Thirteen nests were counted; however, all nests failed to fledge young (U.S. Navy, 2001g). This colony is believed to be the same colony that traditionally nested near Commonwealth Edison's Waukegan generating station, the only colony of Common Terns known to nest in the State of Illinois along Lake Michigan.

Six species of waterfowl are known to nest on NAVSTA Great Lakes. In addition to using open water areas of Lake Michigan and the harbors of NAVSTA Great Lakes, Mallard ducks (*Anas platyrhyncos*) and Canada Geese (*Branta canadensis*) may nest in the panne and lakeshore wetlands, although most Canada Geese are found near ponds within NAVSTA Great Lakes. Blue-winged Teal (*Anas discors*), Lesser Scaups (*Aythya affinis*), and Northern Pintails (*Anas acuta*) nest in grassy areas and uplands, such as found in the dune communities of the lakeshore. Wood Ducks (*Aix sponsa*) may nest in tree cavities of the woodland of the lake bluffs. Several other species of migratory waterfowl *(Table 3-2)* are known to use Lake Michigan and the harbors of NAVSTA Great Lakes and Fort Sheridan during migration.

Mammals

Native mammals that may inhabit the beach and lakeshore wetland plant communities near the central utility plant include the deer mouse (*Peromyscus maniculatus*), white-footed mouse (*Peromyscus leucopus*), Eastern cottontail (*Sylvilagus floridanus*), and the raccoon (*Procyon lotor*) and coyote (*Canis latrans*) while foraging. Most lakeshore plant communities near the central utility plant are limited in extent and do not support medium and large-bodied mammals on a permanent basis, but are large enough to support small mammals that are habitat generalists. The Norway rat (*Rattus norvegicus*) and Red fox (*Vulpes vulpes*) are occasional inhabitants of the beach areas near the central utility plant. Non-native species, such as the house mouse (*Mus musculus*), may inhabit the beach communities as well.

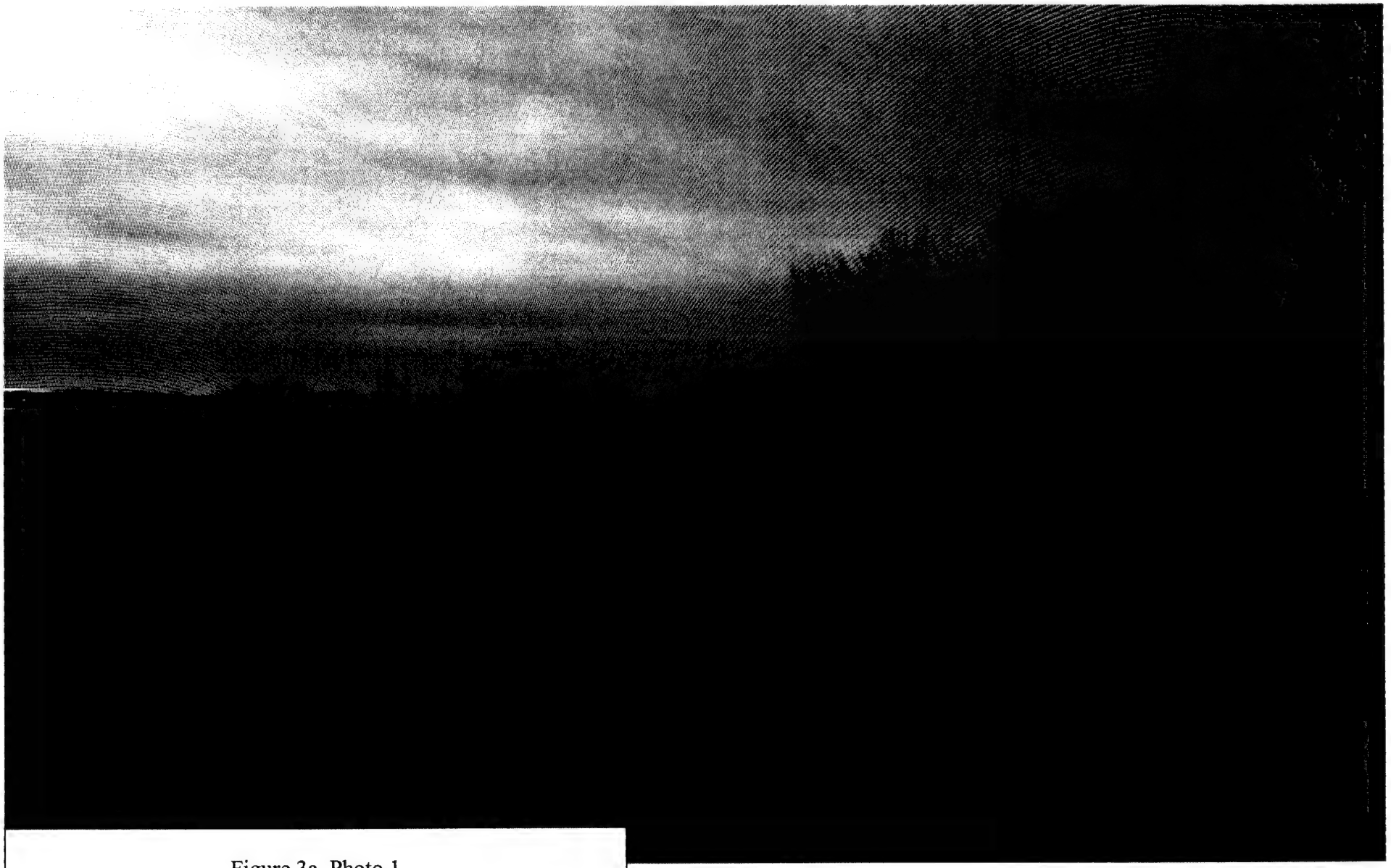


Figure 3a Photo 1
Looking towards the south along Lake Michigan shoreline
at sand dune and panne wetland areas
East of Central Utility Plant

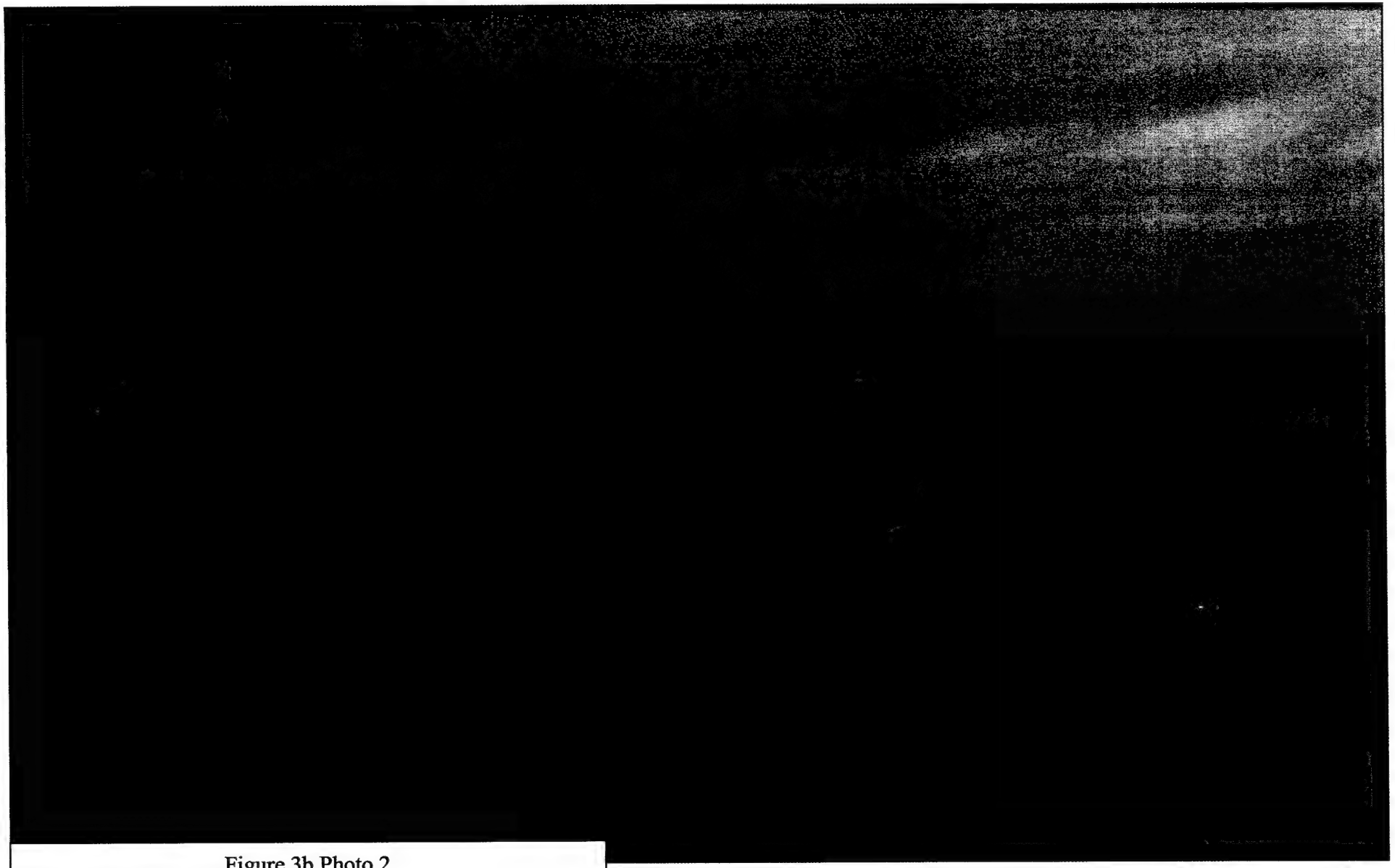


Figure 3b Photo 2
Looking towards the north along Lake Michigan shoreline
at sand dunes and panne wetland areas
South of Central Utility Plant

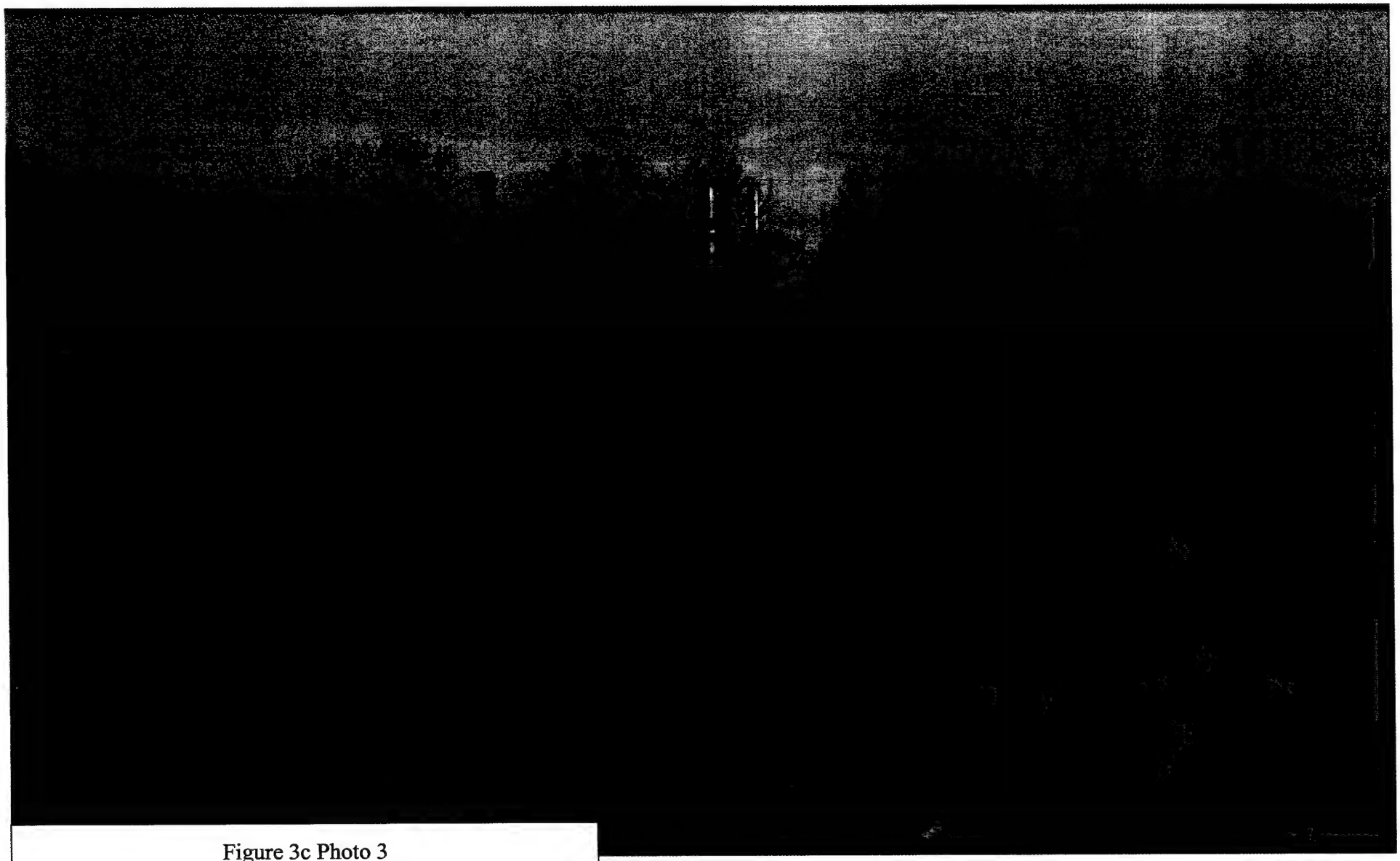


Figure 3c Photo 3
Looking towards the north near Lake Michigan shoreline
At sand dunes and panne wetland areas
Central Utility Plant in background

FIGURE 3

FIGURE 3

FIGURE 3

3.1.2.3 Threatened and Endangered Species

The U.S. Fish and Wildlife Service (USFWS) lists three species of animals and one plant species as threatened or endangered in Lake county (USFWS, 1999). Lack of suitable habitat for most of these species and urbanization surrounding NAVSTA Great Lakes reduces the possibility of finding any Federal-listed threatened or endangered species on this location. The Illinois Endangered Species Protection Board (IESPB) lists 299 species of plants as endangered and 58 as threatened in Illinois. In addition, 21 species of fish are state-listed as endangered and nine species are threatened. Nine species of amphibians and reptiles are state-listed as endangered, with the same number listed as threatened. Thirty two species of birds are state-listed as endangered and nine species are threatened. Six species of mammals are state listed as endangered, and three as threatened.

Plants

Three plant species, the Eastern prairie fringed orchid (*Platanthera leucophaea*), Pitcher's thistle (*Cirsium pitcheri*) and Prairie bush-clover (*Lespedeza leptostachya*), are Federal-listed as threatened in Lake County (USFWS, 1999). These species were not documented in a floral survey of NAVSTA Great Lakes conducted in 1995. The Eastern prairie fringed orchid requires mesic to wet prairies, a habitat that does not exist at NAVSTA Great Lakes. The Eastern prairie fringed orchid has been identified within the Illinois Beach State Park.

Lakeshore dunes provide potentially suitable conditions for the Federal-listed endangered Pitcher's thistle on NAVSTA Great Lakes, and this plant eventually may colonize this location. The Pitcher's thistles are also located within Illinois Beach State Park. The USFWS re-introduced Pitcher's thistle to Lake County as part of the recovery effort for this plant (USFWS, 1999).

The 1995 floral survey found within NAVSTA Great Lakes five species of plants on the state threatened and endangered species lists (*Table 3-3*). Most of these species were found in the lake bluffs and in the panne community. Forked aster was found only in Pettibone Ravine at NAVSTA Great Lakes.

Invertebrates

The USFWS currently lists the Karner blue butterfly (*Lycaeides melissa samuelis*) as extirpated in Lake County (USFWS, 1999), but also states that the potential for this butterfly to inhabit the county remains. The loss of oak savannahs and pines to urbanization and suppression of naturally occurring fires are the primary reasons for the loss of the Karner blue butterfly within Lake County (USFWS, 2000a). Because the areas surrounding the central utility plant lack these types of plant communities, the presence of the Karner blue butterfly is unlikely.

Reptiles and Amphibians

No species of reptiles or amphibians within Lake County is Federal-listed as threatened or endangered (USFWS, 1999). Because no amphibians or reptiles were documented on NAVSTA Great Lakes during recent faunal surveys, the potential that state-listed threatened or endangered species of reptile or amphibian would be found are minimal.

Birds

No Federal-listed threatened or endangered species nesting sites are currently established at NAVSTA Great Lakes. The Piping Plover (*Charadrius melodus*), American peregrine falcon (*Falco peregrinus*), Least tern (*Sterna antillarum*) and Bald Eagle (*Haliaeetus leucocephalus*) are potential transient migrants along the shores of Lake Michigan (U.S. Navy, 1998a), though none are likely to nest on NAVSTA Great Lakes. The Piping Plover prefers nesting on undisturbed sandy beaches near water bodies. The nearest designated critical habitat for the Piping Plover to NAVSTA Great Lakes is 3.0 miles (4.0 km) to the north, north of the Waukegan Beach groin or break wall. The sandy beach areas near the central utility plant is easily accessible to foot traffic, which creates a relatively low, but constant, level of disturbance. This disturbance makes these beaches unsuitable as nesting habitat for Piping Plovers. There is an area within the Illinois Beach State Park that has been recently designated as Piper Plover Habitat. The shoreline areas of nearby Lake Michigan provide opportunities for peregrines to prey on migrating or summering shorebirds. However, peregrines have not been recently documented at NAVSTA Great Lakes. The area surrounding the central utility plant is urbanized and lacks sufficient nesting trees for the Bald Eagle.

NAVSTA Great Lakes is used as a feeding and resting site by migrant birds, and is important to the conservation of state-listed threatened and endangered species. A breeding bird survey was conducted in 1995 at Great Lakes. According to the survey, endangered or threatened migratory birds use NAVSTA Great Lakes for migratory purposes, not breeding purposes. The species were using NAVSTA Great Lakes as a feeding and loafing site during migration or while nesting off-site.

A nesting colony of Common Terns was documented on NAVSTA Great Lakes during the summer of 2002 (U.S. Navy 2002g). This colony appeared to be a colony that was displaced from a location north of NAVSTA Great Lakes. The colony did successfully breed during the summer of 2002, which resulted in twenty six (26) fledges. State-listed species occurring at or near Illinois Beach State Park include the Black-crowned Night Heron (*Nyctocorax nyctocorax*), Upland Sandpiper (*Bartramia longicauda*), Henslow's Sparrow (*Ammodramus henslowii*), Doublecrested commorant (*Phalacrocorax auritus*), American bittern (*Botaurus lentiginosis*) and Common Terns (*Sterna hirundo*) (IDNR, 2001a).

Mammals

The Indiana bat (*Myotis sodalis*) is considered endangered in all counties of Illinois (USFWS, 1999) and is the only Federal-listed threatened or endangered species of mammal in Lake County. The normal hibernation habitat (caves and abandoned mines) is not found near the central utility plant areas. This bat requires riparian and floodplain forests to form successful maternity colonies and as foraging habitat. Because this type of habitat is not found in the proposed construction area, the presence of this bat is highly unlikely.

Based on a recent faunal study, the presence of state-listed threatened or endangered mammals near the central utility plant is unlikely because of the high degree of urbanization and limited amount of available habitat (U.S. Navy 2000a and 1995).

Aquatic Species

The pallid sturgeon (*Scaphirhyncus albus*) is the only Federal-listed endangered species of fish in Illinois (USFWS, 1999 and 2000b). This fish is an inhabitant of large river systems with silty bottoms and having a diversity of depths and velocities formed by braided channels, sand bars, sand flats and gravel bars. These conditions do not exist at the central utility plant area. Eighteen species of fish are state-listed as endangered, and eight are threatened, within Illinois. None of these species were documented from the harbors or Lake Michigan along the shore of NAVSTA Great Lakes during previous surveys.

Of the state-listed threatened and endangered species of fish, four species (lake sturgeon, longnose sucker, cisco and greater redhorse) may occur in lakeshore areas. These species are found in large lakes at various depths, with the lake sturgeon usually occurring at the greatest depths. Although these species are indigenous to Lake Michigan, none have been identified in the immediate NAVSTA Great Lakes area. The other fish state-listed as threatened or endangered are inhabitants of streams, rivers, or vegetated lakes and ponds, conditions that do not occur in areas near the central utility plant.

3.1.2.4 Wetlands

A wetlands delineation survey was performed on NAVSTA Great Lakes, excluding Willow Glen Golf Course, in September 1999 (U.S. Navy 1999). The Chicago District, USACE verified this delineation in March 2000 (U.S. Navy, 2001g). Five wetlands, covering approximately 14 acres (5.7 hectares [ha]), were found within NAVSTA Great Lakes. No wetlands are found in the immediate area of the central utility plant. Two wetlands are to the south of the central utility plant along the shoreline of Lake Michigan. The remaining wetlands verified by the USACE are located within the boundaries of the NAVSTA Great Lakes. The largest lakeshore wetland covers 12.3 acres (5.0 ha) and is located within the Outer Harbor along the shoreline and jetty. This wetland is dominated by herbaceous plants, such as barnyard grass (*Echinochloa*

crusgalli), purple loosestrife (*Lythrum salicaria*), nut sedge (*Cyperus esculentus*), three-square bulrush (*Scirpus pungens*), spike rush (*Eleocharis spp.*), and seedlings of eastern cottonwood (*Populus deltoides*). Purple loosestrife is an invasive exotic species that quickly invades and displaces native species of plants in wetlands. A panne wetland, covering 1.25 acres (0.51 ha), is found between a beach foredune and beach sand ridge near the central utility plant. Willows (*Salix amygdaloides* and *Salix inerior*), purple loosestrife, Canada rush (*Juncus canadensis*), three-square bulrush (*Scirpus pungens*), and water horehound (*Lycopus americana*) dominate the plant community of the panne.

TABLE 3-1 FISH DOCUMENTED IN NTC GREAT LAKES HARBORS AND ADJACENT LAKE MICHIGAN

Common Name	Scientific Name
Alewife	*Alosa pseudoharengus*
Rock Bass	*Ambloplites rupestris*
Black Bullhead	*Ameiurus melas*
White Sucker	*Catostomus commersoni*
Lake Whitefish	*Coregonus clupeaformis*
Carp	*Cyprinus carpio*
Carp x Goldfish	*Cyprinus carpio x Carassius auratus*
Gizzard Shad	*Dorosoma cepedianum*
Northern Pike	*Esox lucius*
Golden Shiner	*Notemigonus crysoleucas*
Emerald Shiner	*Notropis atherinoides*
Coho Salmon	*Oncorhynchus kisutch*
Rainbow Trout	*Oncorhynchus mykiss*
Chinook Salmon	*Oncorhynchus tshawytscha*
Rainbow Smelt	*Osmerus mordax*
Yellow Perch	*Perca flavescens*
Bluntnose Shiner	*Pimephales notatus*
White Crappie	*Pomoxis annularis*
Brown Trout	*Salmo trutta*
Lake Trout	*Salvelinus namaycush*

Source: U.S. Navy, 1993b

TABLE 3-2 BREEDING AND MIGRATORY SPECIES OF BIRDS THAT INHABIT OR NEST ON BEACHES OR LAKESHORE WETLANDS OF LAKE MICHIGAN

Common Name	Scientific Name	Habitat Used (1)	Breeding Status (2)
Spotted Sandpiper	*Actitis macularia*	B	Br
Dunlin	*Calidris alpina*	B	M
Sanderling	*Calidris alba*	B	M
Killdeer	*Charadrius vociferous*	B	Br
American Avocet	*Recurvirostra Americana*	B	M
Common Tern	*Sterna hirundo*	B	Br
Forster's Tern	*Sterna forsteri*	Bw	Br
Caspian Tern	*Sterna caspia*	B	M
Great Blue Heron	*Ardea herodias*	Bw	Br
Black-crowned Night Heron	*Nycticocorax nycticocorax*	Bw	Br
Common Snipe	*Gallinago gallinago*	W	Br

Sora	*Porzana Carolina*	W	M
American Coot	*Fulica Americana*	W	M
Green Heron	*Batorides striatus*	W	M
Mallard	*Anas platyrhyncos*	W, O	Br
Redhead (duck)	*Atythya Americana*	O	M
Wood Duck	*Aix Sponsa*	WL, O	Br
Canada Goose	*Branta Canadensis*	W, O	Br
Snow Goose	*Anser caerulescens*	O	M
Northern Pintail	*Anas acuta*	U, O	Br
Blue-winged Teal	*Anas discors*	U, O	Br
Lesser Scaup	*Aythya affinis*	U, O	Br
Bufflehead	*Bucephala albeota*	O	M
Hooded Merganser	*Lophodytes cucullatus*	O	M
Redbreasted Merganser	*Mergus serrator*	O	M

(1) B = Beaches, W = Wetlands, Bw = Beaches and wetlands, U = Uplands and grassy dunes, O = open water, WL = Woodlands
(2) Br = Breeding, M = Migrant

Source: U.S. Navy, 2000a

TABLE 3-3 STATE LISTED THREATENED AND ENDANGERED SPECIES DOCUMENTED ON OR NEAR BEACHES AND LAKESHORE WETLANDS OF NTC GREAT LAKES

Common Name	Scientific Name	Status
Marram grass	*Ammophila breviligulata*	E
Sea Rocket	*Cakile edentula*	T
Seaside spurge	*Chamaesyce polygonifolia*	E
Forked aster	*Aster furcatus*	T
Green yellow sedge	*Carex viridula*	E
Pied-billed Grebe	*Podilymbus podiceps*	T
Black-crowned Night Heron	*Nycticocorax nycticocorax*	E
Forster's Tern	*Sterna forsteri*	E
Common Tern	*Sterna hirundo*	E

*T = threatened, E = endangered

Source: U.S. Navy, 1995 and 2000a; IDNR, 2001a

3.1.3 WATER RESOURCES

3.1.3.1 Surface Water

NAVSTA Great Lakes is located within two major drainage basins. Green Bay Road, which runs north-south through the area, was constructed on a topographic high, which serves as the divide between the Lake Michigan Watershed and the Mississippi River Watershed. Areas east of Green Bay Road, including the central utility plant, drain toward Lake Michigan. Areas to the west drain toward the Mississippi River through a system of tributaries and rivers (U.S. Navy, 2000c). The central utility plant is located approximately 750 feet west of Lake Michigan and approximately 1,700 feet from Pettibone Creek. No surface water features are present at the central utility plant.

Lake Michigan is at its lowest level in 35 years due to local drought and additional interrelated factors, exposing rocks in some areas that were not visible several years ago and requiring boaters to be cautious. As of March 2003, the lake was approximately 0.5 feet (0.15 m) above the record low in 1964, according to the United States Army Corps of Engineers Website (www.lre.usace.army.mil) and associated water level data. The water level problem has been building since 1997, due to a combination of factors: lower precipitation, lower runoff, higher air temperatures and higher evaporation.

The Pettibone Creek system consists of a north and south fork that merge and flow east into Lake Michigan via the Boat Basin. Construction of the Boat Basin in 1906 and additional construction in the Basin, Inner Harbor and Outer Harbor during the 1940's at NAVSTA Great Lakes altered the lower reach of Pettibone Creek and a portion of Lake Michigan. Silt has filled in most of this area, reducing surface water depth from less than 1.0 (0.3m) to 5.0 feet (1.5m).

3.1.3.2 Stormwater

NAVSTA Great Lakes has been included under the State of Illinois National Pollutant Discharge Elimination System (NPDES) General Permit No. ILR002630 for stormwater discharges associated with industrial activities. Under this permit, NAVSTA Great Lakes is required to develop a Stormwater Pollution Prevention Plan (SWPPP) including elements of best management practices (BMPs) designed to minimize pollution through source control. NAVSTA Great Lakes has identified 18 sites within its property that contain activities that could potentially be sources of pollution to stormwater as defined by Illinois NPDES Permit No. ILR002630.

The Central Utility Plant (Building 11) is covered in the SWPPP for NAVSTA Great Lakes' NPDES industrial permit. To date, stormwater discharge sampling has not been performed for any of the sites in the NAVSTA Great Lakes SWPPP. However, non-storm event (dry weather) stream sampling has been performed on Skokie Creek.
At the Central Utility Plant, most activities are performed indoors and are not likely to be exposed to stormwater runoff; however, there are three (3) existing fuel oil storage

tanks (11E, 11K and 11L) that are used to supply fuel oil to the combustion units in the Central Utility Plant. These fuel oil storage tanks will be converted from No. 6 fuel oil service to No. 2 fuel oil service as part of the proposed action. During tank fuel loading activities, there is a greater exposure to contaminating stormwater; however, these activities are intermittent and conducted for a limited period of time. The facility does not have an oil-water separator associated with its operation. The vehicle parking area currently has no structural stormwater control measures. Stormwater runoff from the site either discharges to the stormsewers along the adjacent road or consists of sheet flow into Lake Michigan. Current stormwater quality control measures associated with the site primarily consist of complying with housekeeping measures including no outdoor uncovered storage of dismantled vehicles, engines, and chassis; all vehicles checked regularly for oil/fluid leaks. Other recent efforts by the Navy to curb and reduce non-point source pollution include reducing the toxicity and volume of pesticides and herbicides used at NAVSTA Great Lakes. Based on the kinds of activities, types of materials, and quantities used or stored, the following types of pollutants have a reasonable potential to be present in stormwater discharges from the Central Utility Plant: oil and grease, gasoline, benzene, toluene, ethylbenzene, xylene (BTEX), polynuclear aromatic hydrocarbons, total suspended solids, pesticides/herbicides, and fertilizers.

There are no physical or operational stormwater quality discharge controls in the areas surrounding the Central Utility Plant. Stormwater runoff from the central utility plant area that is not captured by bordering stormsewer catch basins surrounding Building 11 generally moves under sheet flow conditions into Lake Michigan.

The central utility plant is covered under the NAVSTA Great Lakes SWPPP. The current plan is amended whenever there is a change that may have a significant effect on the potential for the discharge of pollutants to state waters that has not otherwise been addressed in the Plan. Monthly stormwater inspections are conducted of various facilities including the central utility plant. Any changes to a facility are identified and documented in the monthly stormwater inspection report. The SWPPP is amended annually and integrates changes identified in the monthly stormwater inspection reports. The Contractor performing work at the central utility plant will be responsible for implementing the Plan during construction. For any construction work that disturbs one (1) or more acre, the contractor is responsible for submitting a Notice of Intent (NOI), developing and submitting a Stormwater Pollution Prevention Plan and submitting a Notice of Termination (NOT) to the appropriate agencies. The contractor is also required to employ Best Management Practices so potential pollution to stormwater is minimized.

The Lake County Stormwater Management Commission (SMC) has enacted an ordinance entitled "Lake County Watershed Development Ordinance" to establish reasonable rules and regulations regarding development for the purpose of allowing the management and mitigation of the effects of urbanization on stormwater drainage. In a Memorandum of Understanding (MOU) between NAVSTA Great Lakes and SMC, NAVSTA Great Lakes maintains that the purposes of the Lake County Watershed

Development Ordinance are consistent with responsibilities as a "Steward of the Environment" for Navy property at NAVSTA Great Lakes. Without waiving sovereign immunity, NAVSTA Great Lakes has implemented programs to ensure development projects will be reviewed for consistency with the SMC ordinance. Wherever practicable, SMC recommendations will be incorporated into NAVSTA Great Lakes projects. According to the MOU, "all development projects meeting the ordinance criteria of being a major, minor, or public road development will be submitted for SMC's review and comment." The proposed actions are projects for which SMC is notified and comments are requested.

3.1.3.3 100-Year Floodplain

There are two types of floodplains at NAVSTA Great Lakes, riverine and coastal floodplains. Flooding of riverine areas is caused by storm runoff events that exceed the natural carrying capacity of the channel. Flooding of the Lake Michigan coast areas result from excessive high tides, wave run-up from high winds, and storms (U.S. Navy, 1998a). Historically, localized flooding has occurred along Pettibone Creek and Skokie Creek, in isolated upland depressional areas, and during major storm events, in the streets and building areas within the developed areas of the NAVSTA Great Lakes.

3.1.3.4 Process Wastewater

Process water used to operate the central utility plant primarily consists of blowdown. The existing operation is a closed loop system that does not use non-contact cooling water and reuses condensate.

3.1.3.5 Groundwater

Although Lake Michigan supplies NAVSTA Great Lakes with potable water, groundwater has been the traditional source of potable water for non-lake front communities. Regionally, there are five water-bearing hydrogeologic units located beneath NAVSTA Great Lakes. These aquifers are, in order of increasing depth below surface, the Glacial Drift, the Silurian Dolomite, the Glenwood-St. Peter Sandstone, the Ironton-Galesville Sandstone, and the Mt. Simeon Sandstone (U.S. Navy, 1998a).

The first two aquifers, Glacial Drift and Silurian Dolomite, are known as the shallow aquifers and are found at depths ranging from 150 to 500 feet (46 to 152 m) below land surface. The shallow aquifer systems are located in northern Illinois and southern Wisconsin and are recharged by infiltration of rainfall. The shallow aquifer system is thin or absent in some locations, and water quality is often poor due to the presence of naturally occurring gas, oil, and hydrogen sulfide. The remaining aquifers are considered part of the deep aquifer system, and they occur at depths ranging from 900 to 1,900 feet (274 to 579 m) below land surface. These aquifers are present throughout Lake County and typically exhibit high yields of good-quality water.

Glacial deposits that are up to 300 feet (91 m) thick underlie NAVSTA Great Lakes. This material is poorly sorted and is a possible source of area groundwater. Sand and gravel lenses located throughout the deposited glacial till may serve as localized aquifers, while fine-grained till deposits may serve as aquitards.

The water table is typically within 10 feet (3.0 m) of the ground surface in most parts of the NAVSTA Great Lakes, and will intersect the surface in low-lying areas. The shallow water table intersects Pettibone Creek after periods of heavy rainfall. Groundwater movement is primarily horizontal through the till, and rates of movement are slow due to low hydraulic conductivities. With depth, pore spaces are filled with calcareous cement, and this serves to isolate the overlying till from the aquifers found at depth (U.S. Navy, 1998a).

3.2 MAN-MADE ENVIRONMENT

3.2.1 CENTRAL UTILITY PLANT

The following discussions present a brief description of the existing facilities that are currently present at the central utility plant. The central utility plant consists of six (6) boilers that have natural gas and No. 6 fuel oil firing capabilities. The primary fuel for the boilers is natural gas and No. 6 oil is used as a backup fuel. At times, when natural gas is not available or is more expensive than fuel oil, No. 6 fuel oil has been used as the primary fuel. The boilers are located inside a building (Building No. 11) and the building is located approximately 750 feet west of Lake Michigan. The central utility plant is supported by various equipment and utilities that are needed to produce and transport steam to satisfy NAVSTA Great Lakes' heating requirements.

3.2.2 HAZARDOUS MATERIALS AND WASTE

NAVSTA Great Lakes is a Large Quantity Generator (LQG) of hazardous waste as defined by the Resource Conservation and Recovery Act (RCRA). A generator is "any person, by site, whose act or process produces hazardous waste" or whose act first causes hazardous waste to become subject to regulation. NAVSTA Great Lakes currently generates hazardous waste in quantities greater than 2,200 pounds (1,000 kilograms) per calendar month. To avoid classification as a RCRA treatment, storage, or disposal facility, requiring full compliance with RCRA and a RCRA permit, NAVSTA Great Lakes must remove and dispose of all generated hazardous waste within 90 days from date of collection.

Currently, Illinois has an EPA-approved state hazardous waste program, and NAVSTA Great Lakes complies with the federal and state requirements as administered by the Illinois EPA. NAVSTA Great Lakes must file an annual report with the state as a hazardous waste generator and comply with Illinois' hazardous waste program as implemented through the Rules and Regulations of the Illinois Environmental Protection Agency, Illinois Administrative Code, Title 35: Environmental Protection, Subtitle G, Waste Disposal, Chapter I: Pollution Control Board, Parts 700—739. The Illinois hazardous waste program closely parallels the federal requirements for management of hazardous waste.

As a LQG, under state and federal regulations, NAVSTA Great Lakes must identify all hazardous waste generated, obtain an EPA identification number, follow accumulation and pre-transport requirements, manifest hazardous waste shipments, track hazardous waste shipments and prepare reports, prepare contingency plans and spill response procedures, train workers, maintain records and files, and determine generator requirements under the land disposal restrictions.

NAVSTA Great Lakes initially submitted a RCRA hazardous waste operating permit in 1980 that was later withdrawn from consideration. Site investigation activities conducted in 1986 were initiated as a result of the initial RCRA permit application.

Since the RCRA permit application was withdrawn, the NAVSTA Great Lakes has not operated under RCRA as an interim status facility.

NAVSTA Great Lakes has registered with the EPA and the Illinois EPA as a LQG and holds registration numbers 097125504 and IL7170024577 with each agency, respectively. Most of the hazardous waste generated and stored at the facility results from service and maintenance activities. In particular, dry cleaning and painting operations generate the largest volume of hazardous waste.

Hazardous wastes generated at the central utility plant are disposed through the Environmental Department. No hazardous wastes are accumulated on-site and stored for longer than 90 days. There are 13 satellite hazardous waste accumulation areas at the NAVSTA Great Lakes (U.S. Navy, 2002b). The Environmental Department is responsible for coordinating the removal of hazardous waste and non-hazardous waste through contract with a licensed contractor (U.S. Navy, 1999l). Currently, hazardous materials and hazardous waste at the central utility plant are handled according to the approved NAVSTA Great Lakes Hazardous Waste Management Plan (U.S. Navy, 2002b).

Although the parts washer solution used at the central utility plant is non-hazardous when it is clean, during use it becomes contaminated with flammable materials and becomes a hazardous waste for disposal purposes. The parts washers generate approximately 350 gallons of hazardous waste per year. The central utility plant also generates approximately 400 gallons of other miscellaneous hazardous waste including 200 gallons of corrosion inhibitor that is managed as a hazardous waste.

In 1998, NAVSTA Great Lakes closed 11 hazardous waste satellite accumulation areas (U.S. Navy, 1998d). To do so, closure investigations were conducted under the Navy Environmental Compliance Account (NECA) (U.S. Navy, 1999aa).

The Navy developed the Navy Assessment and Control of Installation Pollutants (NACIP) program to identify and control environmental contamination from past use and disposal of hazardous substances. The NACIP is part of the Navy's Installation Restoration Program (IRP), and is similar to the EPA's Superfund Program authorized by the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (U.S. Navy, 1986). The NACIP at NAVSTA Great Lakes has progressed through staged investigations. Phase I, the Initial Assessment Study (IAS), was conducted in 1986. The investigation identified 14 sites as having a potential for environmental contamination and proposed 7 sites for additional investigations or confirmatory sampling. Based on the recommendations of the IAS, the Navy schedules Confirmation Studies for those sites that have been determined by scientific and engineering judgment to be potential hazards to human health and the environment.

3.2.2.1 Waste Oil

The central utility plant generates significant amounts of waste oil; over 11,000 gallons

of waste oil was generated in fiscal year 2002. The majority of the waste oil is water containing small concentrations of oil. Over 10,000 gallons of waste oil can be characterized as wastewater containing small amounts of oil. Activities such as air compressor clean-outs generate significant amounts of wastewater that contain small amounts of tramp oils. Maintenance activities and lubricating oil changes account for the remaining waste oils generated at the central utility plant. It is disposed through the Environmental Department. The Environmental Department is responsible for coordinating the removal of waste oil and hazardous waste through contract with a licensed contractor (U.S. Navy, 1999l). Currently, waste oil at the central utility plant is handled according to the approved NAVSTA Great Lakes Hazardous Waste Management Plan (U.S. Navy, 2002b).

As a result of maintenance activities, leaking equipment and normal facility operations, there has been oil spillage in Building 11. All oil spillage was dealt with in accordance with all requirements, including the Hazardous Waste Management Plan. Approximately 4000 gallons of absorbent material was disposed of in fiscal year 2002.

3.2.2.2 Asbestos

Building 11 was built in 1906. Asbestos Containing Material (ACM) has been identified in this building. The operations and maintenance survey for this building are maintained by the Asbestos Program Manager at PWC Safety, Building 2016. Building records indicate that the predominant types of interior ACM include, but are not limited to doors, tank insulation, preformed pipe insulation and floor tile (U.S. Navy, Cape Environmental Management Inc., December 1995, January 1996). A building inspection was conducted in January 2003 to collect samples and further identify asbestos containing materials. Sampling and inspections were performed by United Analytical Services, Inc. (Exelon Federal Services Group, January 2003). The results of the inspection indicated that there are several areas that contain asbestos containing materials. Guidelines are in place at NAVSTA Great Lakes to protect against health effects related to ACM. Plans for project details are required to be submitted for review by the Asbestos Program Manager, Mr. Richard Glanc. A notice that the building contains ACM is posted at the maintenance facility.

3.2.2.3 Lead Based Paint

A lead survey will be conducted to identify lead based paints before any demolition activities or equipment upgrades; however, since Building 11 was constructed in 1906, it is likely that paints in the proposed work areas contain lead.

3.2.2.4 Emergency Planning and Community Right to Know (EPCRA)

In addition to the materials described above that are used for maintenance and cleaning activities for the boilers, there are many combustion by-products generated as a result of burning natural gas and No. 6 fuel oil. Many of the combustion by-products are elements or chemical compounds that are contained in Section 313 of EPCRA.

3.3 SOCIOECONOMIC ENVIRONMENT

3.3.1 COMMUNITY SETTING AND LAND USE

NAVSTA Great Lakes is located in North Chicago, Lake County, Illinois, approximately 35 miles north of the business center of the City of Chicago. The municipalities located adjacent to NAVSTA Great Lakes are the City of North Chicago to the north, the Village of Lake Bluff to the south, and unincorporated areas of Shields Township to the south and west, including two Arden Shores subdivisions. Lake Michigan shapes the eastern boundary of the NAVSTA Great Lakes (*Figure 1*). Land use surrounding the central utility plant consists of training and support facilities, recreational areas, maintained open areas and natural areas. Land use immediately surrounding the central utility plant consists of the undeveloped panne wetland and dune areas to the southwest, Lake Michigan to the east and an undeveloped steep hill to the immediate west.

3.3.2 ZONING

NAVSTA Great Lakes, including the central utility plant, is zoned as a Public Land District by the City of North Chicago. This district was established to provide for the uniform classification of land that is owned by public agencies and that is used for public purposes, or for purposes that are exempt from the City of North Chicago's zoning ordinance.

The City of North Chicago does not have anyy jurisdiction regarding use of the property, since the underlying zoning designation is Public Land District, and the property is owned by the federal government (City of North Chicago, 1999a).

The central utility plant is located within the municipal boundaries of North Chicago; however, there are several other communities surrounding NAVSTA Great Lakes. The zoning districts (which include a combination of Shields Township, North Chicago, Lake Bluff, and Lake County zoning districts) surrounding NAVSTA Great Lakes are Intensive Industrial to the north and northeast; Intensive Industrial, Estate, and Country Estate residential districts to the east; Residential, and Suburban Estate Residential to the south; and Residential, Estate Residential, and Public Land to the west (U.S. Navy, 1993 and 1994; Lake County, 2000). In general, land use patterns surrounding NAVSTA Great Lakes are consistent with these zoning designations.

3.3.3 POPULATION AND DEMOGRAPHICS

The population of Lake County was 516,418 in 1990 and has grown to 644,356 according to the Census 2000 Redistricting Data. The population of the City of North Chicago was 34,978 in 1990 (U.S. Bureau of the Census, 1990) and has grown to an estimated 42,435 in 1999 (City of North Chicago, 1999b). However, the Census 2000 Redistricting Data lists the 2000 population of North Chicago as 35,918. The population of the Village of Lake Bluff was 5,486 in 1990, and has grown to an estimated 6,056 according to the Census 2000 Redistricting Data. In contrast, the population of Shields

Township in 1990 was 45,132 and decreased to an estimated 39,992 in 1996 (Lake County, 1999). Of the persons 25 years of age or older in Lake County, North Chicago, and Lake Bluff, approximately 15.3, 20.8, and 2.8 percent, respectively, do not hold a high school diploma or general equivalency diploma; and 37.9, 17.2, and 67.4 percent, respectively, hold an associate's degree or higher. The median age in Lake County, North Chicago, and Lake Bluff is 31.7, 21.6, and 38.7 years, respectively (University of Missouri - St. Louis, undated).

As of September 2002, there were approximately 13,273 students and 9,536 personnel at NAVSTA Great Lakes. This number may fluctuate periodically due to the occurrence of surge in student population during the fall and winter.

3.3.4 ECONOMIC ACTIVITY

According to the Census 2000 Summary Data, Illinois General Assembly Economic & Fiscal Commission and Great Lakes Quarterly Population Reports, the labor forces in Lake County, Great Lakes and North Chicago total approximately 337,181, 21,392 and 9,064 respectively. The unemployment rate for Lake County and North Chicago is approximately 3.59 and 9.2 percent, respectively (IGAEFC 2003 and U.S. Navy 2003e). The top five employers in Lake County include NAVSTA Great Lakes; Abbott Laboratories; Hewitt Associates; Motorola Inc.; and Kemper Insurance (U.S. Navy, 2003f).

The 2000 median household incomes in Lake County, North Chicago, and Lake Bluff were approximately $66,973, $38,180, and $114,521, respectively. Approximately 5.7 percent, 15.1 percent, and 1.1 percent of the populations in Lake County, North Chicago, and Lake Bluff, respectively, live below the national poverty level according to the Census 2000 Summary Data

NAVSTA Great Lakes plays an important part in the economy of the region through military and civilian payroll, and associated retail sales and sales tax, state income tax revenues, construction expenditures, and visitor-generated revenues. The total annual economic benefit to Lake County from NAVSTA Great Lakes from salaries, contracts, and purchases is estimated at $391.7 million (U.S. Navy, 1999a). Estimated annual tax revenues, including sales tax and state income tax are $21.1 million (U.S. Navy, 1993 and 1994). The average annual salary for appropriated fund civilian personnel is approximately $35,500 (U.S. Navy, 1999a).

3.3.5 ENVIRONMENTAL JUSTICE

3.3.5.1 Executive Order 12898

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations*, mandates that federal agencies identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of the programs on minority and low-income populations. A

minority population is defined as a group of people and/or a community experiencing common conditions of exposure or impact and consisting of persons classified by the U.S. Bureau of the Census as Negro/Black/African-American; Hispanic; Asian or Pacific Islander; American Indian, Eskimo, or Aleut; or other non-white persons. A low-income population is defined as a group of people and/or a community that, as a whole, live below the national poverty level. For example, the average poverty level threshold for a family of four people in 1989 and 2000 was a total annual household income of $12,674 and $17,050, respectively (U.S. Department of Commerce, Bureau of the Census, 2000). Disproportionate environmental impact occurs for a minority population or low-income population when the risk or rate from exposure to an environmental hazard exceeds the risk or rate of the general population and, where available, to another appropriate comparison group (DOD, 1995; EPA, 1998).

NAVSTA Great Lakes, including the central utility plant, is located within Census Block Group 8630.00:9. The potential effects of the proposed action have been evaluated in accordance with the requirements of the Executive Order, and are documented in *Section 4.3.4*.

3.3.5.2 Executive Order 13045

Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*, mandates that federal agencies identify and assess environmental health and safety risks that may disproportionately affect children as a result of the implementation of federal policies, programs, activities, and standards. The closest public schools to the project area include Forrestal Elementary, South Elementary, and Yeager Pre-Kindergarten. Forrestal Elementary is located within NAVSTA Great Lakes. Forrestal Pre-Kindergarten and South Elementary are nearby.

3.3.6 SAFETY

The Great Lakes Police Department (GLPD) and military personnel provide police protection and security services at NAVSTA Great Lakes. The GLPD has primary responsibility for the security of NAVSTA Great Lakes, with military and civilian guards providing security at all gates. The City of North Chicago also has concurrent jurisdiction. NAVSTA Great Lakes has retroceded jurisdiction to the State of Illinois; thus, crimes committed on the Federal property at NAVSTA Great Lakes are subject to State or Federal prosecution (the Federal Magistrate or the State's Attorney for civilian offenses, or military courts-martial for military personnel)(U.S. Navy, 2000d).

Fire protection at NAVSTA Great Lakes is provided by the Great Lakes Fire Department, which is staffed by full-time federal civilian personnel. NAVSTA Great Lakes is located in Quadrant IV under the Mutual Aid Box Alarm System (MABAS), which covers those areas generally south of the Wisconsin border to the southern portions of NAVSTA Great Lakes and areas east of Libertyville. The MABAS enables local jurisdictions to assist one another in case of extreme fire events. Emergency

medical services at NAVSTA Great Lakes are provided by the Naval Hospital located at NAVSTA Great Lakes (U.S. Navy, 2000d).

3.3.7 PUBLIC SERVICES

The primary public services supplied to the central utility plant consist of water, wastewater, electricity, stormwater drainage, solid waste collection, and telephone service. These services are provided either by PWC or by off-site suppliers.

3.3.7.1 Potable Water Supply

The potable water system is operated by and maintained by the Public Works Center (PWC). The system includes a raw-water intake in Lake Michigan, a water treatment plant, storage tanks, booster pumps, and distribution water mains. Treated water is piped throughout the complex through 16-, 10-, 8-, and 6-inch (41-, 25-, 20-, and 15-cm) lines.

NAVSTA Great Lakes maintains reciprocal agreements with adjacent municipalities to obtain emergency water. The agreement with the City of Waukegan is for a maximum of 2 million gallons per day [7.6 million liters per day], while the agreement with the City of North Chicago is for 2.88 million gallons per day (10.90 million liters per day).

3.3.7.2 Wastewater

The sanitary sewer system serving both NAVSTA Great Lakes and the VA Hospital Complex is operated and maintained by the PWC Great Lakes and is pumped to and treated by the North Shore Sanitary District plant in Gurnee, Illinois. Sanitary sewer lines servicing the central utility plant run north-south on the east side of the Plant. There is another sewer line that runs north-south and enters the Power Plant on the north side of the building. It appears that the sewer line entering the building collects wastewater from the basement floor drains. This "secondary" sanitary sewer line eventually ties into the primary sanitary sewer lines servicing the Power Plant. Sanitary sewer flow from the Power Plant discharges into the "north-south" sanitary sewer line (located east of Building 11), which flows south towards the water plant then east towards Building 45N. NAVSTA Great Lakes may discharge up to 10.5 million gallons per day (39.7 million liters per day) to the District for treatment. Average discharges range from 4.5 to 4.7 million gallons per day (17 to 17.8 million liters per day), with a recorded peak flow of 6.5 million gallons per day (24.6 million liters per day).

There are several bathrooms located in the central utility plant complex, which includes Building 11 and Building 12. Sanitary sewer lines from both Building 11 and Building 12 tie into the common "north-south" sanitary sewer line described above. A bathroom inventory of the central utility plant complex indicates that there are six (6) men's bathrooms, two (2) women's bathrooms and two (2) "shared" bathrooms.

3.3.7.3 Electrical

NAVSTA Great Lakes purchases approximately 92 percent of its electrical power from Commonwealth Edison Company. The other eight percent of power is provided by steam turbines in Building 11 at the NAVSTA Great Lakes. Current NAVSTA Great Lakes peak usage is about 30 megawatts in the summer with about 20 megawatts the rest of the year. The total system is rated at 37 megawatts.

3.3.7.4 Solid Waste

Office and household solid waste at NAVSTA Great Lakes, including the central utility plant, is disposed in trash containers, picked up weekly, and transported for disposal to nearby landfills in Zion (Browning Ferris Industries and Grayslake (Countryside). The current solid waste collection contract is with Onyx Co. NAVSTA Great Lakes also has a recycling program and recycles various wastes generated at the central utility plant including aluminum cans, paper and miscellaneous metals.

3.3.8 TRANSPORTATION AND NAVIGATION

The highway system in the NAVSTA Great Lakes area provides excellent linkage to the major metropolitan areas of Chicago, Milwaukee, and Waukegan. North-south highways, including Interstate Highway 94, Skokie Highway (U.S. Route 41), Green Bay Road (State Route 131), and Sheridan Road, provide access to NAVSTA Great Lakes. Primary access to the NAVSTA Great Lakes is via Buckley Road (State Route 137), traversing east to west, and Sheridan Road traversing north to south. Major improvements were made to these roadways in 1986 and 1991. A new traffic signal system was installed on Buckley Road from Interstate Highway 94 to NAVSTA Great Lakes. Both Buckley Road and the portion of Sheridan Road adjacent to the base are four lanes wide. Military Traffic Command study data indicate that Buckley Road now functions as a Navy corridor, with more than 80 percent of vehicle movement related to NAVSTA Great Lakes. Buckley Road currently carries approximately 23,500 vehicles per day. The current capacity of Buckley Road can meet traffic demand through the year 2010 (U.S. Navy, 1994).

The central utility plant can be accessed via interior NAVSTA Great Lakes roads, with Ziegemeier Street being the primary north-south NAVSTA Great Lakes road that runs along the beach.

Boat traffic on Lake Michigan includes military, commercial and private watercraft. The lake is also used for water-sport activities such as boating, sailing, water skiing and fishing. There are a total of 34 charter-fishing boats at Waukegan Harbor that may be fishing in the area of the NAVSTA Great Lakes. The IDNR and the Illinois Natural History Survey use gear such as gill nets and trap nets in shallow water in the vicinity of NAVSTA Great Lakes (IDNR, 2001a). The NAVSTA Great Lakes Harbor Master must approve craft entering and exiting of the NAVSTA Great Lakes Inner Harbor (U.S. Navy, 2001f). Bathymetric surveys of the beach training sites are performed each year

to assist in navigation during training exercises of a Navy Reserve Assault Craft Unit Based at NAVSTA Great Lakes.

3.3.9 RECREATION

Recreational facilities, activities, and services available at NAVSTA Great Lakes include the following:

- Gymnasiums (4)
- Willow Glen Golf Course
- Bowling alley
- Library
- Automotive skills center
- Swimming pools (3)
- Beaches on Lake Michigan (2)
- Family Activities Centers (3)
- Child development centers (4)
- Young Adult Program
- Travel agency
- Marina
- Gear rental shop
- Picnic area
- Night club
- Video game room
- Petty Officer's lounge
- Sports bar
- Eagle's Nest restaurant
- Java Coast Coffee Bar
- Recruit Recreation Center
- Ship Rec Recreation Center
- Undergrounds Café
- USO (Building 27)

The beach areas near the central utility plant are located on Federal property and are not open to the general public. The beach areas are open to Navy personnel and their families for swimming, sunbathing and picnicking. The Great Lakes Marina, which offers boating, sailing, or fishing to Navy personnel and their families, is located outside of the Inner Harbor adjacent to and south of the aforementioned beach areas. In addition, the Marina operates a recreational vehicle camping facility located north of the referenced beach areas.

The lake is used for water-sport activities such as boating, sailing, water skiing and fishing. There are a total of 34 charter-fishing boats at Waukegan Harbor that may be fishing in the area of the NAVSTA Great Lakes (IDNR, 2001a). The NAVSTA Great Lakes Harbor Master must approve craft entering and exiting of the Inner Harbor (U.S. Navy, 2001f).

3.3.10 CULTURAL RESOURCES

The central utility plant is located within the approximate 193-acre (78-hectare [ha]) historic district located on the east side of NAVSTA Great Lakes, adjacent to Lake Michigan (IHPA, 2001). The historic district contains 124 buildings, structures and sites. Of these, 44 represent contributing components of major significance to the historic district, 19 are of minor significance and the remaining (61) are non-contributing properties. The properties of minor significance include the many structures along the lakeshore, such as breakwaters, small craft berths, bulkheads and jetties. In addition to the buildings and structures described, certain sites and natural features are important to the character and significance of the historic district. Man-made features include the

Inner Harbor and the parade ground known as Ross Field. Both retain their original appearance and contribute strongly to the historic context of the area. Pettibone Ravine, Pettibone Creek and the lakeshore are all natural features that were critical to the founding, organization and development of NAVSTA Great Lakes. These natural features retain their appearance, and enhance the historic character of the district (U.S. Navy, 2000e and 2001g).

The property surrounding the central utility plant was predominantly farmland until about 1905. As a result of private donations, the United States government acquired much of the NAVSTA Great Lakes property in 1905. From 1905 through 1911, many buildings were designed and built at Great Lakes including the Power House, which is the current location of the central utility plant. The Power House was constructed in 1906. Since 1911, there have been several facility upgrades and improvements. In 1991, a Programmatic Agreement was made between NAVSTA Great Lakes, the Advisory Council on Historic Preservation and the Illinois State Historic Preservation Officer (SHPO) concerning the historic district. Pursuant to that agreement, any planned work on or immediately adjacent to central utility plant is subject to review and evaluation by SHPO (U.S. Navy, 1994 and 2001g).

An archeological survey conducted during 1999 at NAVSTA Great Lakes resulted in the documentation of seven sites, a concentration of apparent World War I era artifacts and a compacted gravel and tar surface that probably represents the location of a temporary wooden structure (Site 11-L-627), was recommended as eligible for inclusion on the National Register of Historic Places (NRHP); however, none of the sites are located near the central utility plant. Although there is a reported archeological site on top of the bluff adjacent to the Inner Harbor (Site 11-L-628), it is not located within the area of the proposed central utility plant upgrades.

4.0 ENVIRONMENTAL IMPACTS

This section provides baseline information for understanding the environmental consequences of the central utility plant upgrade alternatives. It provides information to serve as a baseline from which to identify and evaluate environmental consequences resulting from the proposed action. Resources evaluate the project setting and existing conditions associated with the physical, biological, and socioeconomic environment. The activities for the proposed action would generally include the following operations:

- Obtaining permits,
- Clearing (site preparation),
- Stockpiling materials,
- Staging construction materials on the site,
- Managing construction and demolition waste, special and hazardous wastes,
- Providing fuel (diesel, gasoline) for on-site equipment,
- Managing solid waste,
- Managing stormwater and pollution prevention planning,
- Decommissioning and demolition of three boilers,
- Installation of cogeneration equipment or upgraded boilers,
- Installation of assorted mechanical and electrical support equipment needed to operate the referenced equipment.
- Converting three fixed roof tanks from No. 6 fuel oil service to No. 2 fuel oil service, and
- Finishing activities including site clean-up and signage.

4.1 NATURAL ENVIRONMENT

4.1.1 EARTH RESOURCES

4.1.1.1 Topography

Outside construction will occur in areas that have mostly asphalt and hard gravel surfaces. Most of the proposed structures will be built in areas surrounded by existing buildings whose primary purpose is to produce energy and that are heavily used. There would be nominal outside construction for Alternative Three.

There is a bluff immediately west of Building 135 where a proposed natural gas compressor enclosure for the proposed combustion turbine projects would be built. It is likely that a small area at the base of the bluff and some portions of the bluff would be excavated to provide space for the compressor station. The total volume of soil requiring excavation to install the compressor station would be small. In addition, the proposed compressor station would be built in an area surrounded by existing buildings, including Building 11, Building 135 and Building 11J. The proposed equipment installations are consistent with the surrounding environment. Changes to the

topographical elevations as a result of the proposed construction activities will be negligible.

4.1.1.2 GEOLOGY AND SOILS

Construction, including associated excavation, will be necessary to install several pieces of equipment for the combustion turbine projects. Several components and structures will require concrete pads that are supported with appropriate foundations. The gas compressor, ammonia above ground tank, diking for the ammonia tank, backup generators and transformer will require concrete pads that will be supported by footers ranging in depth from four (4) to twelve (12) feet below the finished grade. Again, the proposed equipment installations are located in and around buildings that are used for energy production. Most of the excavations will occur in areas that currently have asphalt or hard gravel surfaces. Because of the locations of the proposed excavations, it is very likely that soils in these areas have already been disturbed. The boiler replacement alternative will not involve any excavation activities.

The above ground ammonia tank will be equipped with secondary containment. There are no special handling and storing requirements for ammonia. The ammonia is an aqueous based material that contains more than 80% water. As per the Material Safety Data Sheet for the ammonia material, the ammonia does not have a flashpoint and has a low flammability rating.

During reconstruction and application of new soil to be added to the site, soil erosion may temporarily increase. Construction activities that affect one acre or more require preparation of a Notice of Intent (NOI) under the requirements of the NPDES General Permit for Construction Activities. The requirements of the NOI include the preparation and implementation of a Stormwater Pollution Prevention Plan (SWPPP). This SWPPP must include erosion and sediment controls, including interim and permanent stabilization practices. The total land area for these proposed construction activities should be less than one (1) acre and, therefore, an NOI should not be required for this project.

The Contractor must immediately report to the National Response Center any spills of regulated hazardous substances that are equal to or exceed the Reportable Quantity levels listed in 40 CFR Parts 110, 117, and 302. The Contractor would also be required to submit a written description of the spill to the EPA Regional Office and would be responsible for any required cleanup. The Contractor would be required to comply with all applicable federal, state, and local laws and regulations related to the prevention and mitigation of accidental spills of hazardous substances to the extent practicable (33 USC 1251 *et seq.*; 42 USC 9601 *et seq.*; 42 USC 6901 *et seq.*).

The Lake County SMC has developed a Watershed Development Ordinance (WDO) that was approved as amended by the Lake County Board on August 10, 1999 (SMC, 1999). The WDO was created to ensure that development does not create unstable conditions susceptible to erosion or increase flood and drainage hazards to others. The

requirements to prevent soil erosion found in the Lake County SMC ordinance would be considered on a case-by-case basis during the early stages of planning and design and would be implemented where practicable under the terms and conditions of the MOU between the NAVSTA Great Lakes and SMC (SMC, 1999). The Lake County Stormwater Management Commission (SMC) has provided comments in regards to the Alternative One (based on the type of construction, Alternative One would potentially have the biggest impact on stormwater). According to SMC's letter, the proposed actions would meet the intent of the Lake County Watershed Development Ordinance and SMC has no objections to implementing Alternative One (See Appendix J).

Because of the conditions describe above, the potential for soil erosion for this project should be low. Most of the land area for this project has already been developed and the total construction areas are small. For these reasons, no significant impacts related to geology or soils are anticipated for the proposed action alternative.

4.1.2 AIR RESOURCES

No long-term air impacts are expected as a result of the proposed action. There may be short-term air impacts during construction activities. The potential air emission sources during construction activities may include fugitive dusts and emissions resulting from truck traffic delivering equipment and supplies. A temporary concrete mixing plant or concrete trucks will be used to produce or deliver concrete. Activities associated with concrete work may also produce fugitive emissions. Standard construction tasks associated with this project such as welding, pipe-fitting and structural steel installation may also generate fugitive emissions.

A conformity determination is required when specified pollutants exceed thresholds established in 40 CFR Part 93 in areas designated as *nonattainment*. There are several categories for *nonattainment* areas including Extreme, Severe, Serious, Moderate and Marginal. Depending on the pollutant and category of *nonattainment*, there are various thresholds. NAVSTA Great Lakes is located in a *nonattainment* area for ozone that is classified as severe.

Since the Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone, proposed federal actions must show conformity to the State Implementation Plan (SIP) before they can be implemented. Therefore, an applicability analysis was performed to determine whether a formal conformity determination would be required. Alternative One was determined to be exempt from a formal Conformity Determination because the anticipated direct and indirect emissions from the proposed activity for specific criteria pollutants (non ozone precursors) are in *attainment*, covered by an existing exemption, or are expected to be below thresholds as per 40 CFR 93.153(b)(1). (see further discussions in this section, and the Record of Non-Applicability contained in *Appendix C*). For VOM, Alternative One would produce less than 25 tons per year (T/yr) [22.7 metric T/yr]. In addition, five-year emissions netting calculations for VOM indicate that VOM emissions would be well below 25 tons/year, which would exempt NAVSTA Great Lakes from a conformity determination for VOM.

When calculating emissions for conformity determination applicability purposes, permitted emissions *increases* over the last five (5) years for a specific pollutant are totaled and compared against thresholds established in 40 CFR Part 93. These five (5) year emission totals include potential emission reductions as well, e.g. equipment that is removed usually results in reduced emissions. In this case (Alternative One), the total net VOM emissions over the last five (5) years are 12.48 tons. Under 40 CFR Part 93, the specified threshold for VOM in a severe nonattainment area (NAVSTA Great Lakes) is twenty five (25) tons per year. Consequently, NAVSTA Great Lakes is below the conformity determination VOM threshold.

Alternative Two would also be exempt from a formal conformity determination based on the same logic and calculations discussed above. AP-42 Emission Factors are the same for 5 MW combustion turbines and 10 MW combustion turbines that burn natural gas. Consequently, emissions from Alternative Two would be comparable to emissions from Alternative One.

Based on consultant information, it does not appear that Alternative Three would be subject to a conformity determination. For NOx, the EPA has granted an exemption from the general conformity requirements for NO_x within the Lake Michigan Ozone Study modeling domain, which includes portions of the states of Illinois, Indiana, Michigan, and Wisconsin (61 Federal Register 2428-January 26, 1996).

NAVSTA, Great Lakes has *attainment* designations carbon monoxide, sulfur dioxide, PM-10, NOx and lead, which are pollutants for which a conformity determination could be required. Because this area is designated as an attainment area for these specific criteria pollutants, a conformity determination is not required for these pollutants.

An NSR/PSD applicability determination was conducted for Alternative One and is contained in the Construction Air Permit Application for the Cogeneration and Fuel Oil Conversion Projects (Exelon Federal Services Group, November 2002). It should be noted that areas designated as *attainment* must perform an applicability determination for PSD and that areas designated as *nonattainment* must perform an applicability determination for NSR. For the PSD analysis, emissions netting methods were used to calculate the potential emissions increases for NOx, CO, NOx and SO2. Emissions reductions for the proposed boiler shutdowns and annual emissions increases from other permitted emissions (e.g. the gas turbine installations for the schools) over the last five (5) years were summed with the potential emissions from the proposed COGEN project. The total net emissions for CO, PM10, NOx and SO2 were compared with PSD Significant Emissions Rate thresholds. Based on these calculations, CO, PM10, NOx and SO2 did not exceed PSD Significant Emission Rate thresholds (see Appendix D). Therefore, NAVSTA, Great Lakes would not be subject to PSD requirements as a result of implementing Alternative One. A similar analysis for Alternative Two indicates that PSD Significant Emission Rate thresholds would also not be exceeded. Based on consultant information, Alternative Three would trigger major modification thresholds for NOx and carbon monoxide and would be subject to a PSD review.

For the PSD applicability determination, a source is required to include previous and prospective emissions changes at the source within the 5-year period prior to the date of construction. For the contemporaneous reductions associated with shutting down Boilers No.1, No. 2 and No. 3, the last two (2) years of operating data prior to equipment shutdown can be used to calculate emission reductions, providing that the information is representative. Contemporaneous reductions information is based on guidance provided in EPA's New Source Review Workshop Manual. As per Chapter A, Section III.B.4 in the guidance manual, the language states, "For an existing unit, actual emissions just prior to either a physical or operational change are based on the lower of the actual or allowable emissions levels. The 'old' emissions level equals the average rate (in tons per year) at which the unit actually emitted the pollutant during the 2-year period just prior to the change which resulted in the emissions increase" (See website http://www.epa.gov/ttn/nsr/gen/wkshpman.pdf).

The NSR applicability determination for Volatile Organic Material (VOM) uses the same emissions netting methods described above (Exelon Federal Services Group, November 2002). Based on calculations to determine annual VOM emissions for Alternative One and NSR applicability, the net emissions increase for VOM is well below twenty five (25) tons per year or the NSR Significant Emissions Rate (see Appendix E). Based on consultant information, Alternative Two and Alternative Three would also be below the NSR Significant Emissions Rate. The EPA has granted an exemption from the general conformity requirements for NO_x within the Lake Michigan Ozone Study modeling domain, which includes portions of the states of Illinois, Indiana, Michigan, and Wisconsin (Federal Register, 1996). Therefore, NAVSTA Great Lakes would not be subject to NSR requirements as a result of the proposed alternatives.

Ammonia will be used and stored in an above ground tank for Alternative One and Alternative Two. The above ground tank will be approximately 10,000 gallons and aqueous ammonia is listed as a regulated substance under the Accidental Release Prevention Program rule, or Section 112 (r) of the Clean Air Act Amendments; however, Section 112 (r) lists aqueous ammonia with an ammonium concentration equal to or greater than 20% by weight as a regulated substance. According to the Material Safety Data Sheet (MSDS) for the referenced ammonia, the ammonium concentration is less than 20% and, therefore, this material is not subject to Section 112 (r) requirements.

Additionally, the potential for temporary increases in fugitive dust emissions in the immediate vicinity of construction site exists. Construction machinery exhaust emissions are estimated to be of relatively short duration and of moderate intensity. Since construction equipment and activities are required to meet Illinois EPA standards for exhaust emissions, and since these exhaust emissions are expected to be of relatively small quantities, no significant, long-term deterioration of air quality is expected. The pollutants emitted to the ambient air directly or indirectly from the proposed construction activities would not significantly impact the ambient air quality of the region and would not jeopardize compliance with state and federal ambient air quality standards.

4.1.3 SOUND

A noise study (see Appendix F) was prepared for Alternative One and the impacts on the nearest receptor were evaluated. In this case, Building 140 (Port-o-Call) was selected as the nearest receptor. There are two (2) primary noise sources associated with Alternative One and Alternative Two including:

1.) Noise generated from Gas Turbine operations;
2.) Noise generated from diesel-fired Backup Generator operations.

As part of the noise study for Alternative One, the total individual sound levels for both the Gas Turbines and the Backup Generators were calculated. The total sound level for the Gas Turbine is the sum of the individual noise sources and includes the exhaust stack, air intake, ventilation intake and ventilation exhaust.

Noise levels were calculated inside Building 140. Noise levels were compared with Noise Criteria (NC) curves for specific occupancies including residences (20-30) and offices (30-35). Both NAVFAC and ASHRAE manuals use NC curves to determine acceptable noise levels for different occupancy types. Noise levels for both of the referenced noise sources were plotted against increasing octave band frequencies. For the Gas Turbine operations or Alternative One, the sound levels were below the NC 30 and NC 35 curves.

For the Backup Generators, there were two (2) noise levels above the NC 35 curve; however, the sound levels were only two (2) dB above the NC 35 curve and NAVFAC accepts two (2) dB above the NC 35 as a recommended range. It is important to note that the backup generator operation represents 3% of the total central utility plant's operation so exposure to these "elevated" sound levels will be limited. Also, this study did not consider the vegetation located between Buildings 11 and 140. Vegetation acts as a sound barrier and this study did not include the benefits of vegetation, which would further reduce sound levels.

Based on data contained in Navy design manuals (U.S. Navy, 1983), sound levels for a 10 MW gas turbine, which would be used for Alternative Two, are approximately two (2) to five (5) dB higher than a 5 MW gas turbine (2 X 5 MW gas turbines would be used for Alternative One). Because sound levels are based on logarithmic equations, combining sound levels for two (2) X 5 MW gas turbines will increase the overall sound levels nominally. Consequently, the overall sound levels for operating two (2) X 5 MW gas turbine is comparable to operating one (1) X 10 MW gas turbine. Alternative Three involves boiler replacement so sound levels using this alternative would be similar to or less than current central utility plant sound levels.

In addition, the central utility plant is an existing facility and sound levels have always been elevated in this area. For these reasons, no significant impacts related to sound are anticipated for the proposed action alternative.

4.1.4. BIOLOGICAL RESOURCES

4.1.4.1 Vegetation

Alternative One and Alternative Two would require removal of some areas of vegetation. The installation of the compressor station does require some excavation and there is some vegetation in this area; however, the undeveloped land used for this construction would be very small, i.e. and the compressor station would be staged on a concrete pad. The remaining construction associated with Alternative One and Alternative Two would occur inside a building and on asphalt and hard gravel surfaces and would have negligible effects on vegetation. Construction for Alternative Three would occur inside Building 11 and would not impact vegetation. The proposed alternatives and land usage are consistent with current land use and no significant impact to vegetation would be anticipated.

4.1.4.2 Wildlife

Although there is the potential to temporarily disturb some wildlife habitat areas, there is no sensitive wildlife in the immediate vicinity of the work to be done under the proposed Action Alternatives. The beach habitat along Lake Michigan is potentially the most sensitive wildlife area; however, the Lake Michigan shoreline is approximately 750 feet from the proposed alternatives and 750 feet should provide an adequate buffer for wildlife. Construction involves mostly developed areas and the proposed alternatives are consistent with current land usage. No significant or long-term impacts to wildlife are expected.

4.1.4.3 Threatened and Endangered Species

No federally listed threatened or endangered species are known to occur within the project area. Therefore, no significant impacts to any federally listed threatened or endangered species would be anticipated.

4.1.4.4 Wetlands

No impacts to wetlands are anticipated as a result of upgrading the central utility plant. The closest wetland and panne to the proposed project is located near Nunn Beach; however, the project is located approximately 750 feet away from these areas and the majority of the construction and equipment upgrades would occur inside buildings and/or on asphalt and hard gravel surfaces. No direct or indirect impacts are anticipated to occur.

4.1.5 WATER RESOURCES

4.1.5.1 Surface Water

Lake Michigan is approximately 750 feet from the proposed project. Alternative One and Alternative Two include installing an above ground tank that will contain ammonia. The above ground tanks would have secondary containment. Piping will be installed to transport No. 2 fuel from the existing above ground storage tanks to the backup generators. Potential spillage of hazardous substances or oils contaminating Lake Michigan from the referenced sources is remote. This is because the ammonia above ground tanks will be equipped with secondary containment. In addition, in the unlikely event of an oil spill, Lake Michigan is located far enough from chemical storage and transport activities that oil spillage to Lake Michigan is unlikely; however, NAVSTA, Great Lakes does have a Facility Response Plan that addresses chemical and oil spills. In the Navy On-Scene Coordinator Oil and Hazardous Substance Spill Contingency (NOSC) Plan, materials and equipment used for response actions are identified. There is also a Regional Response Team (RRT) that is composed of federal and state agency representatives with regional coordinating responsibilities for pollution incident contingency planning, preparedness and response. Each EPA region has an RRT. These regional bodies coordinate planning and preparedness functions prior to an oil and hazardous substance (OHS) incident, and advise and assist following an actual pollution incident. Alternative Three would utilize existing facilities so there would be no increased adverse effects to surface water using this alternative.

During construction, the Contractor will be contractually required to notify the Navy of any hazardous substance releases or spills. The contract will contain contingency information, including spill notification procedures.

No discharge from the proposed action alternatives should occur, although the potential for spillage does exist. All proposed action alternatives would conform to and observe the provisions of the Oil Pollution Act of 1990 and the Clean Water Act. No significant impacts are anticipated.

4.1.5.2 100-Year Floodplain

Executive Order 11988, *Floodplain Management*, requires that Federal agencies avoid activities that directly or indirectly result in development of floodplain areas. Based on reviews of the Federal Emergency Management Agency published Flood Insurance Rate Maps and Floodway maps, the 100-Year Floodplains are located along Lake Michigan east of Ziegemeier Street. The central utility plant or Building 11 is located west of Ziegemeier Street. The proposed alternatives would not occur within the 100 Year Floodplain and no significant impacts to the 100-Year Floodplains along Lake Michigan is anticipated.

4.1.5.3 Process Wastewater

Alternative One and Alternative Two would produce some process wastewater. New floor drains would be installed for these two alternatives. Wastewater collected in the floor drains and wastewater generated as a result of these alternatives would be discharged to an oil/water separator. Treated water from the oil/water separator would be discharged to the sanitary sewer system.

Water used to operate Alternative One and Alternative Two would be less than currently used to operate the central utility plant. In addition to wastewater generated from the oil/water separator, there would be scheduled blowdowns that use significant amounts of water; however, the number of boilers would be reduced from three (3) to two (2) boilers resulting in the need for fewer blowdowns and reduced water usage for proposed Alternative One and Alternative Two. Alternative Three would generate about the same or less volume of process wastewater when compared with the existing boiler systems; however, the new boiler systems for Alternative Three may require less blowdown, and therefore create less wastewater because they are more efficient.

It is important to understand that process wastewater modifications require permit changes and approval from the Illinois Environmental Protection Agency (IEPA) and the North Shore Sanitary District. Changes in wastewater volumes and characteristics must be reflected in the Discharge Control Document (DCD). Wastewater discharges must also comply with sewer and sewer systems ordinances established by the North Shore Sanitary District. Therefore, a permit amendment request that identifies above wastewater changes will have to be submitted to both Agencies for approval. These wastewaster process and flow changes would be minor and, as discussed above, actual wastewater flows would decrease as a result of Alternative One and Alternative Two. Consequently, no significant impacts related to process wastewater changes are anticipated as a result of the proposed action alternatives.

4.1.5.4 Groundwater

The potential for groundwater contamination as a result of the proposed action alternatives is remote. The majority of the equipment would be installed inside Building 11 for Alternatives No. 1, No. 2 and No. 3. There will be several equipment installations outside (including an above ground Ammonia Station Tank) for Alternatives No. 1 and No. 2; however, the Ammonia Tank and other storage vessels containing hazardous chemicals would be equipped with secondary containment. For Alternative Three, the potential impacts to groundwater are the same as the existing facility. As a result of these proposed hazardous chemical containment measures for Alternative One and Alternative Two, routes to the environment would be minimized and no direct or indirect impacts to groundwater are anticipated to occur.

4.2 MAN-MADE ENVIRONMENT

4.2.1 FACILITIES

Because of changing energy needs, central utility plant improvements are needed to improve efficiencies and increase electrical production capacities. The net elimination of one boiler using Alternative One or Alternative Two would still provide the same steam loading while improving energy savings and efficiencies. Increasing electrical capacity allows NAVSTA Great Lakes to be more energy self-sufficient and reduce energy costs.

4.2.2 HAZARDOUS MATERIALS AND WASTE

Hazardous waste generation at the central utility plant is primarily the result of maintenance activities. The net hazardous waste generation resulting from maintenance activities and the installation of proposed Alternative One or Alternative Two should be comparable to, or less than, the current amount of hazardous waste generated. The replacement of three (3) old boilers with two (2) new upgraded energy efficient boilers may reduce the amount of maintenance required and quantity of chemicals needed to properly service the boilers (U.S. Navy, 2003a). Any new hazardous wastes generated as a result of the proposed equipment upgrades will be handled in accordance with all applicable requirements and the NAVSTA Hazardous Waste Management Plan. Since Alternative Three involves boiler replacement only, hazardous waste generation using this alternative will be comparable to, or less than, current waste generation rates for these activities.

The proposed construction could result in the generation of minor amounts of hazardous waste. During construction, the Contractor would be required to adhere to RCRA requirements for waste classification and disposal. Based on the classification of waste, the disposal of construction debris would comply with RCRA provisions, as necessary. Hazardous waste sent off-site for disposal would require disposal documentation; Hazardous Waste Manifest procedures would be followed with appropriate "cradle-to-grave" record keeping and tracking performed. Based on RCRA requirements, the generator of hazardous waste during construction would be the Navy and would be so designated on the waste disposal manifests. The Navy would continue to compile and submit annual reports on waste generation volumes and rates.

Subsurface testing and environmental sampling for hazardous waste are not planned for any of the action alternatives because little subsurface work will be done. If hazardous waste is encountered, work must stop and the Environmental Office shall be notified. Management and proper disposal of buried HW encountered during construction activities would be in accordance with all applicable local, state, and federal environmental and safety regulations.

4.2.2.1 Asbestos

All alternatives will require some degree of asbestos abatement. An asbestos inspection was performed in Building 11 and asbestos containing materials were identified in several areas (See Appendix G). As part of the Navy's asbestos abatement strategy, an asbestos abatement plan must be prepared for all project work involving asbestos. Asbestos abatement efforts must comply with all applicable standards including Federal (TSCA, AHERA), IEPA requirements and Navy specifications as per Section 13281. Waste sent off-site for disposal would require appropriate disposal documentation including the use of IEPA non-hazardous waste manifests. Waste manifest procedures shall be followed with appropriate "cradle-to-grave" recordkeeping and tracking.

4.2.2.2 Lead Based Paint

Lead based paint abatement will be required for this project. As part of the Navy's lead based paint abatement strategy, a lead based paint abatement plan must be prepared for all project work involving lead based paint. Lead based paint abatement efforts will comply will all applicable standards including Federal, IEPA requirements and Navy specifications as per Section 13282. Waste sent off-site for disposal would require appropriate disposal documentation including the use of IEPA hazardous waste manifests. Waste manifest procedures will be followed with appropriate "cradle-to-grave" recordkeeping and tracking.

4.2.2.3 Emergency Planning and Community Right to Know (EPCRA)

Natural gas would be the primary fuel used to operate equipment using Alternative One, Alternative Two and Alternative Three; however, No. 2 fuel oil would be used for backup purposes for Alternative One, Alternative Two and Alternative Three. These fuel burning activities generate emissions or combustion by-products. Many of the combustion by-products are elements or chemical compounds that are contained in Section 313 of SARA Title III but are below threshold limits for manufactured chemicals of 25,000 pounds. No chemicals listed in Section 302 of EPCRA would be stored at the central utility plant that exceed Section 302 chemical thresholds for Extremely Hazardous Substances. No. 2 fuel oil would be stored in 440,000, 1,000,000, and 1,000,000 gallon above ground tanks located east of the central utility plant. The minimum amount of No. 2 fuel oil stored on hand would be 850,000 gallons. For Alternative One and Alternative Two, ammonia would be stored outside the building about ninety (90) feet northwest of Building 811A in an above ground tank and used for catalytic reduction purposes. Both No. 2 fuel oil and ammonia would exceed threshold quantities for Section 311/312 chemicals and would be tracked for reporting purposes.

4.3 SOCIOECONOMIC ENVIRONMENT

4.3.1 COMMUNITY SETTING AND LAND USE

The primary (underlying) zoning designation for the NAVSTA Great Lakes is Public Land District, which provides for the uniform classification of land that is owned by public agencies and that is used for public purposes, or for purposes that are exempt from the City of North Chicago zoning ordinance. The City of North Chicago does not have primary jurisdiction regarding use of NAVSTA property (City of North Chicago, 1999a). Implementation of the proposed action alternatives would not require a change in zoning at the NAVSTA Great Lakes or the central utility plant. These would be consistent with surrounding land use and energy production.

4.3.2 POPULATION AND DEMOGRAPHICS

The total number of Navy or civilian personnel employed or sailors trained at NAVSTA Great Lakes would not be expected to increase as a result of the implementation of the proposed alternatives. It is expected that most contract personnel responsible for construction activities will already live in Lake County, Illinois area. No significant change in the overall regional population or demographics would be anticipated as a result of the implementation of the proposed action alternatives.

4.3.3 ECONOMIC ACTIVITY

Additional employment opportunities and income related to construction would be generated during the construction period (short-term). Construction associated with the proposed action alternatives would have direct, indirect, and induced effects on area employment, output, and income. Direct effects include those arising from the purchases made by the construction sector, wages and salaries paid to workers directly engaged in the project's construction, as well as capital costs for equipment, materials, and supplies during construction. Induced effects of the project are generated by the consumption of goods and services made possible by the payrolls associated with the construction project. Indirect effects are the sum of all the rounds of purchases by all the interrelated sectors of the state economy (including direct, induced, and all additional effects), beginning with those that supply the suppliers of the construction sector. Indirect effects are produced throughout the local economy at each round of purchases. No significant impact to short-term or long-term area employment and income would be anticipated as a result of the implementation of any of the proposed action alternatives.

4.3.4 ENVIRONMENTAL JUSTICE

NAVSTA Great Lakes is located within Census Block Group 8630.00:9 and adjacent to Census Block Group 8632.02:9. It is anticipated that any adverse environmental impacts, such as temporary impacts related to air quality during construction/demolition activities, would be primarily experienced by those individuals residing in Block Group

8630.00:9, on the base. This Block Group is not classified as having a high minority or low-income population when compared to Lake County as a whole. Implementation of any of the proposed action alternatives would not cause any disproportionate adverse environmental or economic impacts specific to any minority or low-income group or individuals. There are no public schools located directly adjacent to any of the proposed project sites, and no disproportionate environmental health or safety risks to children would be anticipated as a result of the implementation of the proposed action alternative.

The U.S. Navy has not directly nor indirectly used criteria, methods, or practices that discriminate on the basis of race, color, or national origin in the preparation of this document. All reference material used to describe the existing environment and to evaluate potential environmental impacts are commonly available reference sources and do not discriminate on the basis of race, color, or national origin.

4.3.5 SAFETY

The proposed action alternatives would not result in a change in the number of sailors trained at the NAVSTA Great Lakes or to any military civilian or contractor personnel who work here, and overall NAVSTA Great Lakes activities would remain similar to existing conditions; therefore, the need for additional police, fire protection, or emergency medical services is not anticipated as a result of the implementation of any of the proposed action alternatives.

4.3.6 PUBLIC SERVICES

4.3.6.1 Potable Water Supply

Based on per capita usage, water demands for proposed Alternative One, Alternative Two and Alternative Three would generally be consistent with the previous uses at the central utility plant. The proposed action is not expected to increase overall water demand at the central utility plant or NAVSTA Great Lakes. Water demands may actually decrease for Alternative One and Alternative Two because the number of boilers will decrease from three (3) to two (2) and less blowdown will be required. Also, the new and more efficient equipment would be less susceptible to leakage. Alternative Three would probably use less water because of the better technology. No significant impacts to area water supplies are anticipated.

4.3.6.2 Sanitary Sewer

Sanitary sewer demands for the proposed central utility plant upgrades would be consistent with current uses and are not expected to increase after the construction is complete. No significant impacts to area sewage systems are anticipated.

4.3.6.3 Stormwater

The upgrading of the central utility plant using Alternative One or Alternative Two would increase the impervious surface area at this location. The proposed compressor station would be installed and rest on a concrete pad behind Building 135 on undeveloped land; however, the dimensions of the concrete pad would be 36 feet X 42 feet, a relatively small area. A 10,400 gallon above ground tank containing Ammonia would be installed for Alternative One on an existing asphalt surface – this tank installation would not be equipped with a roof and will be exposed to outside weather conditions. Any project upgrades would be integrated into the current Stormwater Pollution Prevention Plan (SWPPP), which is reviewed and amended annually.

The Lake County Stormwater Management Commission (SMC) has provided comments in regards to the Alternative One (based on the type of construction, Alternative One would potentially have the biggest impact on stormwater). According to SMC's letter, the proposed actions would meet the intent of the Lake County Watershed Development Ordinance and SMC has no objections to implementing Alternative One (See Appendix J).

The remaining work or the majority of the project consists of work inside Building 11 or located on asphalt surfaces. These surfaces are and will continue to be impervious after project completion. Alternative Three consists of work conducted inside Building 11 only. For the foregoing reasons, no significant impacts to stormwater flow are anticipated under any of the action alternatives.

4.3.6.4 Solid Waste

Solid waste disposal requirements for the proposed action would be consistent with the previous uses at the central utility plant. No significant change to solid waste collection and disposal at NAVSTA Great Lakes is anticipated as a result of the action alternative. The office waste from these facilities would continue to be transported to area landfills by Onyx Co. Hazardous wastes and remaining non hazardous wastes would continue to be transported by various licensed transporters

As a result of construction activities and equipment installations, asbestos resulting from asbestos abatement activities and construction debris will be generated; however, these waste disposal activities are dependent on construction and will be limited to a short period of time. Consequently, no significant impacts related to solid waste are anticipated for the proposed action alternative.

4.3.7 TRANSPORTATION AND NAVIGATION

Implementation of any of the proposed alternatives is not expected to increase the existing number of vehicles or traffic demand along Buckley Road (currently consisting of 23,500 vehicles per day).

Although there will be increased vehicular traffic on interior roads such as Zeigemeier Street during construction, vehicle traffic will subside after the project is completed and return to pre-construction levels.

The proposed alternatives will not affect any military, commercial and private watercraft operating on lake Michigan. No significant impacts are anticipated.

4.3.8 RECREATION

No significant impact related to community or NAVSATA Great Lakes recreational facilities, activities, or services would be anticipated as a result of the implementation of any of the proposed actions. The proposed alternatives are at a sufficient distance from Lake Michigan so that they will not impact any water recreational activities on Lake Michigan.

4.3.9 CULTURAL RESOURCES

The central utility plant or Building 11 was constructed in 1906 (U.S. Navy 1996). The central utility plant (Building 11) is a contributing facility of Major Significance located within the 193-acre Great Lakes Historic District (See Appendix H) located on the east side of NAVSTA Great Lakes, adjacent to Lake Michigan. Under Alternative One and Alternative Two, a new roll-up door would be installed in Building 11 located on the north wall. Door construction would initially involve removing three (3) layers of brick 30' high X 16' wide. After construction is completed, a new 23 feet X 9.5 feet wide roll up door would be installed using the "old " bricks that were removed. It is important to understand that this building historically has been, and continues to be, used for energy production purposes so that no alteration from historical use will take place. Under Alternative Three, there would be no changes to the exterior of Building 11.

The Illinois Historic Preservation Officer (SHPO) has been notified by letter of NAVSTA Great Lakes' plans to upgrade the central utility plant and install a new roll-up door. The letter requested a concurrence with a "no adverse effect" determination from SHPO. In response to this request, SHPO has sent NAVSTA Great Lakes a letter concurring with NAVSTA Great Lakes' findings of no adverse effect on the historic property (See Appendix J).

Previous archeological surveys conducted at the NAVSTA Great Lakes indicated that no archeological sites are located at the installation; however, both banks along the creek leading from the turning basin/inlet, as well as the bluffs overlooking Lake Michigan, are considered areas of extremely high archeological potential (U.S. Navy, 1999c). The proposed project is not located on the creek banks or on the bluffs. Additionally, archeological surveys were conducted on the RTC in Camp Porter at the site of a suspected Nineteenth Century farmstead along the western boundary of NAVSTA (north of the South Porter Parade Ground) and on the adjacent VA property. These investigations did not identify any archeological sites or deposits eligible for the NRHP (U.S. Navy, 2000o and p).

Additionally, if any archeological or historical remains are uncovered during construction or demolition activities, construction/demolition would cease and the SHPO would be notified. No significant impacts to historic or archeological resources are anticipated.

4.4 CUMULATIVE IMPACTS

Cumulative impacts are those changes to the physical, biological, and socioeconomic environments that would result from the combination of construction, operation, and associated impacts resulting from the proposed action when added to other past, present, and reasonably foreseeable actions. Past projects, or those implemented or built before 2001, can be considered to be part of the existing conditions environment baseline presented in this EA. Included within the concept of past projects are all maintenance activities, land development projects, and other actions that occurred before detailed analysis began on this EA. The cumulative impacts that may result from the proposed action alternatives would be minimal and insignificant when assessed with all other maintenance activities and land development projects at NAVSTA Great Lakes.

During calendar year 2002, a dredging project was completed in the Inner Harbor area near Building 52. The reasonably foreseeable projects in the immediate project vicinity of the proposed central utility plant upgrades include: Dredging the Small Boat Launch area; Condensate Line Replacements; and Boiler VDF Retrofit.

There are plans to install a Co-generation Plant for the North Chicago Veterans Administration Medical Center (VA). The VA has received an air permit to operate three (3) boilers, a backup generator and a gas turbine. The total permitted emissions for this equipment is as follows:

Equipment	Permitted Emissions Limits (Tons/year)
1.) Three (3) Boilers	
NOx	30.3
CO	30.7
SO2	32.3
VOM	4.9
2.) Backup Generator	
NOx	2.0
CO	0.42
SO2	0.13
VOM	0.16
3.) Gas Turbine	
NOx	17.3
CO	17.5
VOM	10.1

Emissions modeling was conducted for the VA Co-generation facility. A modeling analysis was performed for three (3) scenarios including normal operating conditions, worst case impact under normal and backup operating conditions and startup conditions. Air modeling results for these three (3) scenarios were compared with National Ambient Air Quality Standards (NAAQS). The modeling results demonstrate that the proposed Co-generation facility will be in compliance with air quality standards for all three (3) scenarios (U.S. Navy, 2003g).

It is important to understand that the North Chicago Veterans Administration Medical Center is a separate source from NAVSTA Great Lakes. Consequently, air emissions increases or permitting issues for the VA do not effect air emissions increases or permitting issues for NAVSTA Great Lakes. For example, emissions increases at the VA would not be used to determine PSD or NSR applicability for NAVSTA Great Lakes; however, NAVSTA Great Lakes has entered into an agreement to potentially purchase electricity and steam from an independent and private utility provider (Energy Systems Group) and could potentially purchase energy produced by the VA Co-generation facility. The aforementioned VA Co-generation facility will be managed and operated by Energy Systems Group.

Impacts to physical resources related to construction activities, such as sound, air quality and erosion would not contribute substantially to cumulative impacts, since they are typically localized and temporary. Long-term sound and air quality impacts to adjoining areas due to operating combustion turbines and backup generators would be small because these facility/equipment upgrades are consistent with the current use of the facility. Biological resources and socioeconomic impacts would be minor and should remain within the boundaries of NAVSTA Great Lakes. There should be no long-term impacts to community setting, demographics, or employment. Although the dependency for outside electricity will decrease as a result of this project, impacts to regional utilities would generally be minor and would remain within the range of current capacity.

4.5 COMPLIANCE WITH VARIOUS LAND USE POLICIES AND CONTROLS

This EA has been prepared in accordance with the following regulations/guidance:

- National Environmental Policy Act (NEPA) (42 USC 4321 *et seq)*; and Counsul on Environmental Quality (EQ) regulations (40 CFR Parts 1500-1508)
- OPNAVINST 5090.1B (Change 2), which implements, within the Department of the Navy, the requirements set forth by NEPA

A summary of the various laws and coordination requirements and the extent to which the proposed action complies or conflicts with each of these laws and requirements are presented in this section.

4.5.1 CLEAN WATER ACT

The Clean Water Act, as amended, regulates discharges to the waters of the United States. Section 404 of the Act regulates the discharge of dredged or fill material. Section 404 would be applicable to this action if floodplains, wetlands or other waterways are impacted by the proposed action. Any point sources of pollution associated with the proposed action will comply with NPDES permit requirements. This Act also regulates stormwater discharges associated with industrial activity and discharges originating from large and medium municipal separate storm sewer systems. For the proposed action alternatives, releases of stormwater runoff to area streams must adhere to applicable water quality requirements and permit conditions. Compliance with applicable provisions of the Clean Water Act will be accomplished by coordination with the appropriate resource agencies, submittal of permit applications, if required, and response to agency review.

4.5.2 RIVERS AND HARBORS ACT OF 1899

Section 10 of the Rivers and Harbors Act of 1899 prohibits the unauthorized obstruction or alteration of any navigable water of the United States, unless the work has been authorized by the Secretary of the Army by permit. Impacts to navigable water of the United States are not anticipated as part of the implementation of the proposed action.

4.5.3 CLEAN AIR ACT

The Clean Air Act, as amended, provides for protection and enhancement of the nation's air resources. Alternative One and Alternative Two are not expected to create any long-term negative impacts to area air quality, since the daily operations would not generate air pollutant emissions beyond those covered by the existing NAVSTA Great Lakes Title V air permit application. Alternative Three, on the other hand, would have a significant impact on area air quality and would trigger major modification thresholds for NOx and carbon monoxide and be subject to a PSD review.

Particulate matter and other air pollutants resulting from construction/demolition activities would have a short-term air quality impact on the immediate vicinity, but no significant long-term impacts to regional air quality related to the construction, maintenance, or operation of the proposed action plan would occur. The EPA has published final rules on general conformity that apply to federal actions in areas designated *non-attainment* for any of the criteria pollutants under CAA. The Metropolitan Chicago Interstate AQCR is classified as a severe *non-attainment* area for ozone. Therefore, an applicability analysis was performed to determine whether a formal conformity determination would be required. A formal determination would be required if the proposed action generates total air emissions in excess of established *de minimis* levels for ozone precursors NO_x and VOC in the Metropolitan Chicago Interstate AQCR ozone *non-attainment* area. The *de minimis* level of NO_x and VOC is 25.0 TPY (22.7 metric TPY) for each. However, the EPA has granted an exemption, pursuant to Section 182(f)(3) of the CAA, from the general conformity requirements for

NO_x within the Lake Michigan Ozone Study modeling domain, which includes portions of the states of Illinois, Indiana, Michigan, and Wisconsin (Federal Register, 1996). Thus, NO_x computations were excluded from the analysis. As discussed in *Section 4.1.2* and the Record of Non-Applicability contained in *Appendix C*, the estimated VOC emissions from Alternative One, Alternative Two and Alternative Three are expected to be below the *de minimis* levels of 25.0 TPY (22.7 metric TPY). Therefore, a Conformity Determination would not be required under 40 CFR Part 93.153, and the proposed alternatives would be required to conform with the Illinois SIP.

For Alternative One and Alternative Two, ammonia will be stored in an above ground tank that is approximately 10,000 gallons. Under Section 112(r) of the Clean Air Act Amendments, ammonia is a regulated substance; however, Section 112(r) lists aqueous ammonia with an ammonium concentration equal to greater than 20% by weight as a regulated substance. The aqueous ammonia solution that will be used in this process will have an ammonium concentration that is less than 20%. Consequently, this material is not subject to Section 112(r) requirements.

4.5.4 FISH AND WILDLIFE COORDINATION ACT

Section 10 of the Fish and Wildlife Coordination Act directs federal agencies to consult with USFWS, National Marine Fisheries Services, and state agencies before authorizing alterations to water bodies. The purpose of this Act is to ensure that wildlife conservation receives equal consideration and that it be coordinated with other features of water resource programs. No impacts to water bodies will occur as part of the proposed action.

4.5.5 ENDANGERED SPECIES ACT

The Endangered Species Act requires that any action authorized by a federal agency is not likely to jeopardize the continued existence of an endangered or threatened species or result in the destruction or adverse modification of habitat of such species that is determined to be critical. As discussed in *Section 4.1.4.3*, no threatened or endangered species, or known habitat of such species, exist at the central utility plant or in the immediate area surrounding the central utility plant. Therefore, the proposed work would not affect the continued existence or remove or alter any habitat known to be critical to these species.

4.5.6 NATIONAL HISTORIC PRESERVATION ACT

In compliance with applicable federal laws, regulations, and procedures regarding historic preservation, potential impacts to cultural resources have been evaluated for the proposed project. The Great Lakes Historic District, which Bldg 11 is part, is listed on the National Register of Historic Places. However, this building has been and continues to be used for energy production purposes so there is no change from historical use. In addition, SHPO has concurred with NAVSTA Great Lakes that the proposed project and the modification to the building's roll up doors will have no adverse effect on the historic property.

No archeological sites have been identified at the central utility plant; however, if any archeological or historical remains are uncovered during construction or demolition activities, construction and/or demolition would cease and the SHPO would be notified. No significant impacts to historic or archeological resources are anticipated.

4.5.7 COASTAL ZONE MANAGEMENT

The Coastal Zone Management (CZM) Act of 1972, as amended, provides for the effective management, beneficial use, protection, and development of the resources of the nation's coastal zone. The State of Illinois does not have an approved CZM program, so this requirement does not apply.

4.5.8 LOCAL LAND USE PLANS

Implementation of the proposed alternatives would not require a change in land use at NAVSTA Great Lakes. Local land use plans would not be affected by the implementation of the proposed action alternatives.

4.5.9 FLOODPLAIN MANAGEMENT

Executive Order 11988, *Floodplain Management*, requires that federal agencies avoid activities that directly or indirectly result in development of floodplain areas. According to the Federal Emergency Management Agency published Flood Insurance Rate Maps and Floodway Maps as discussed in *Section 4.1.5.2*, the boundaries of the mapped 100-year floodplain do not intersect the boundaries of the central utility plant. The 100-year floodplain would not be affected by the implementation of the proposed alternatives.

4.5.10 WETLANDS

Executive Order 11990, *Protection of Wetlands*, directs agencies to take actions to minimize the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands on federal property. No waters of the United States, including wetlands, exist within the project area. The proposed project would have no impacts to wetlands.

4.5.11 PRIME AND UNIQUE FARMLAND SOILS

The purpose of the Farmland Protection Policy Act is to minimize the extent to which federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses. There are no prime farmland soils located at the central utility plant.

4.5.12 ADMINISTRATION OF ENVIRONMENTAL POLICY (ENVIRONMENTAL JUSTICE)

The potential effects of the proposed action have been evaluated in accordance with the requirements of Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* and Executive Order 13045, *Protection of Children from Environmental Health Risks and Safety Risks*. These executive orders mandate that federal agencies identify disproportionately high and adverse human health or environmental effects on minority and low-income populations and on children. As discussed in *Section 4.3.4*, no disproportionate impact to minority or low-income persons living in the area surrounding the proposed project site would be anticipated as a result of the implementation of the proposed action alternatives. Additionally, no disproportionate environmental health or safety risks to children would be anticipated as a result of the implementation of the proposed action alternatives.

4.5.13 RESOURCE CONSERVATION AND RECOVERY ACT

RCRA states that Federal agencies in their waste disposal and management practices "... will be subject to and comply with all Federal, State, interstate, and local requirements, both substantive and procedural ... respecting control and abatement of solid or hazardous waste disposal." NAVSTA Great Lakes has been operating under a RCRA Interim Status authorization since November 19, 1980, and is registered with the U.S. EPA and the Illinois EPA (097125504; IL7170024577). Most of the hazardous waste generated and stored at the facility is generated as a result of service and maintenance activities. The Environmental Department is responsible for managing the disposal of hazardous waste generated by the central utility plant.

The Contractor would be required to adhere to RCRA requirements for waste classification and disposal. Based on the classification of waste, the disposal of construction debris would comply with RCRA provisions, as necessary. Hazardous waste sent off-site for disposal would require disposal documentation; Hazardous Waste Manifest procedures would be followed with appropriate "cradle-to-grave" record keeping and tracking performed. Based on RCRA requirements, the generator of hazardous waste during construction will be the Navy and would be so designated on the waste disposal manifests. The Navy would continue to develop and submit annual reports on waste generation volumes and rates as required. Specifications developed for the proposed construction projects would require the Contractor to develop plan submittals that will outline specific monitoring and health and safety protection required to prevent accidental exposure or release to the environment. Fuel and other potentially hazardous substances must be handled so that spills, releases to soil, and releases to surface water are avoided and minimized. Health and safety planning and mitigation or emergency response procedures would need to be developed during pre-project planning. NAVSTA would require that the Contractor be in compliance with all appropriate provisions of RCRA.

4.5.14 OCCUPATIONAL SAFETY AND HEALTH ACT

The 1970 Occupational Safety and Health Act (OSHA) was passed "to assure safe and healthful working conditions for working men and women ..." This law created two very important agencies, the Occupational Safety and Health Administration and the National Institute for Occupational Safety and Health (NIOSH). OSHA's main responsibility is to ensure the health and safety of workers. NIOSH is to conduct research in hazard identification and control technology. The Occupational Safety and Health Act codified as 29 U.S.C. §651 *et seq.*, require heads of Federal agencies to establish programs to protect their personnel from occupational hazards, thereby ensuring job safety. Some of the OSHA standards that may be applicable to the proposed action include personal protection equipment, hazardous materials management, excavation and shoring, hazard communication standards, and hazardous waste operations and emergency response requirements.

4.5.15 TOXIC SUBSTANCES CONTROL ACT (TSCA)

The Toxic Substances Control Act (TSCA) of 1976 was enacted by Congress to give EPA the ability to track the 75,000 industrial chemicals currently produced or imported into the United States. EPA repeatedly screens these chemicals and can require reporting or testing of those that may pose an environmental or human-health hazard. EPA can ban the manufacture and import of those chemicals that pose an unreasonable risk. EPA also has mechanisms in place to track the thousands of new chemicals that industry develops each year with either unknown or dangerous characteristics. EPA then can control these chemicals as necessary to protect human health and the environment. TSCA supplements other Federal statutes, including the Clean Air Act and the Toxic Release Inventory under the Emergency Planning Community Right-to-know Act (EPCRA). TSCA would regulate the types of pesticides and herbicides that would be commercially available for the proposed action.

4.5.16 FEDERAL INSECTICIDE, FUNGICIDE, AND RODENTICIDE ACT

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) and its amendments authorize the EPA to regulate the manufacture and use of all pesticides in the United States. FIFRA was essentially rewritten in 1972 when it was amended by the Federal Environmental Pesticide Control Act (FEPCA). The law has been amended numerous times since 1972, including some significant amendments in the form of the Food Quality Protection Act of 1996. EPA regulates the registration and labeling of pesticides, and the certification of pesticide applicators and enforces compliance against the use of banned substances. The EPA works with pesticide manufacturers as well as state and local authorities to achieve the goal of making sure that pesticides do not cause unreasonable harm to human health and the environment.

DoD applicators are required to take written examinations to become certified to apply pesticides. NAVSTA Great Lakes currently has a Pesticide Management Program in place.

4.5.17 COMPREHENSIVE ENVIRONMENTAL RESPONSE, COMPENSATION, AND LIABILITY ACT

The Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) provides a Federal "Superfund" to clean up uncontrolled or abandoned hazardous-waste sites as well as accidents, spills, and other emergency releases of pollutants and contaminants into the environment. Through the Act, EPA is authorized to seek out those parties responsible for any release and assure their cooperation in the cleanup. EPA cleans up orphan sites when potentially responsible parties cannot be identified or located, or when they fail to act. Through various enforcement tools, EPA obtains private party cleanup through orders, consent decrees, and other small party settlements. EPA also recovers costs from financially viable individuals and companies once a response action has been completed.

The Superfund Amendments and Reauthorization Act of 1986 (SARA) reauthorized CERCLA to continue cleanup activities around the country. Several site-specific amendments, definitions clarifications, and technical requirements were added to the legislation, including additional enforcement authorities. Environmental restoration activities at NAVSTA Great Lakes are potentially subject to regulation under CERCLA.

4.5.18 EMERGENCY PLANNING AND COMMUNITY RIGHT-TO-KNOW ACT (EPCRA)

Title III of SARA also authorized EPCRA, which was enacted by Congress as the national legislation on community safety. This law was designated to help local communities protect public health, safety, and the environment from chemical hazards. To implement EPCRA, Congress required each state to appoint a State Emergency Response Commission (SERC). The SERCs were required to divide their states into Emergency Planning Districts and to name a Local Emergency Planning Committee (LEPC) for each district. Broad representation by fire fighters, health officials, government and media representatives, community groups, industrial facilities, and emergency managers ensures that all necessary elements of the planning process are represented. Should the proposed action require significant storage of hazardous materials, those materials would be subject to regulation under EPCRA.

For Tier I, Tier II and Form R reporting purposes, an inventory of "new" chemicals and materials required to operate the upgraded central utility plant and "new" combustion by-products were evaluated. Chemicals and materials needed to operate the proposed equipment and combustion by-products from the proposed equipment were identified and quantified. To operate the upgraded central utility plant, No. 2 fuel oil will be used in lieu of No. 6 fuel. Currently, No. 6 fuel oil is stored in Above Ground Tanks No. 11E, 11K and 11L. An above ground aqueous ammonia tank will also be installed to operate the upgraded central utility plant for Alternative One and Alternative Two. Because these materials would most likely exceed the 10,000 pound reporting threshold, these materials would need to be reported under Tier 1 and Tier II reporting requirements. Alternative Three would not use Ammonia.

Combustion by-products (emissions) resulting from the proposed equipment upgrades will produce elements and chemical compounds contained in the EPCRA Section 313 list; however, there are no Section 313 materials that exceed reporting thresholds.

4.5.19 POLLUTION PREVENTION ACT

The Pollution Prevention Act focused industry, government, and public attention on reducing the amount of pollution through cost-effective changes in production, operation, and raw materials use. Opportunities for source reduction are often not realized because of existing regulations, the industrial resources required for compliance, and the focus on treatment and disposal. Source reduction is fundamentally different and more desirable than waste management or pollution control. Pollution prevention also includes other practices that increase efficiency in the use of energy, water, or other natural resources, and protect our resource base through conservation. Practices include recycling, source reduction, and sustainable agriculture. Operational activities associated with the proposed action should comply with the above-mentioned pollution prevention practices.

4.5.20 OIL POLLUTION ACT

The Oil Pollution Act (OPA) of 1990 streamlined and strengthened EPA's ability to prevent and respond to catastrophic oil spills. A trust fund financed by a tax on oil is available to clean up spills when the responsible party is incapable or unwilling to do so. The OPA requires oil storage facilities and vessels to submit to the Federal government plans detailing how they will respond to large discharges. EPA has published regulations for aboveground storage facilities, and the Coast Guard has published regulations for oil tankers. The OPA also requires the development of Area Contingency Plans to prepare and plan for oil spill response on a regional scale, and requires owners and operators of certain oil storage facilities to prepare and implement Spill Prevention, Control, and Countermeasures (SPCC) plans that detail the facility's spill prevention and control measures. Fuel oil is stored in significant quantities near the central utility plant and is stored in 2 X 1,000,000 gallon and 1 X 440,000 gallon above ground tanks. The above ground tanks currently contain #6 fuel oil used to operate the six (6) boilers in the central utility plant. Fuel oil is used as a backup for natural gas. After implementation of an alternative, No. 2 fuel oil would be used as backup fuel for the proposed alternatives. Under Navy guidelines, NAVSTA Great Lakes is required to maintain a seven (7) day or 850,000 gallons supply of fuel oil (U.S. Navy, 2003a). An approved SPCC plan is maintained and followed that covers fuel oil storage and fuel oil conveyance activities.

4.6 ENERGY REQUIREMENTS AND CONSERVATION POTENTIAL

Energy in the form of various fossil fuels would be required during demolition and construction activities and equipment installation of the proposed alternatives. Energy requirements for potential construction, demolition, maintenance, and operation would not have a significant impact on the energy requirements of the overall region.

Alternative One and Alternative Two, which would use cogeneration technology, offer advantages in efficiency over conventional technologies. By definition, cogeneration is the use of one energy input to produce two (2) energy outputs. For the proposed project, the energy input is fuel and the outputs are electricity and steam used to heat buildings. The electricity is generated by gas turbines and steam is generated by recovering the heat from the turbines. The existing conventional technologies are the purchase of power from public utilities and production of steam from in-house boilers. By taking the combined effect of cogeneration, efficiency is expected to exceed 90% while the efficiency of purchasing and producing the same energies from separated sources are 63% (U.S. Navy, 2003b).

4.7 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

The proposed action alternatives do require an additional commitment of resources. Under Alternative One and Alternative Two, there would be a significant increase in natural gas usage and electricity production capacity, which would supply NAVSTA Great Lakes with most of its electricity needs. To produce the electricity under Alternative One and Alternative Two, the central utility plant would install and operate gas turbines that use natural gas to generate electricity; however; the significant increase in natural gas usage will be offset economically by reduced utility costs. In this case, the local utility is currently providing most of NAVSTA Great Lakes' electricity needs and utility costs will actually decrease as a result of the proposed actions. Under Alternative Three, the objective would not be to produce significant amounts of electricity and, therefore, would not supply NAVSTA Great Lakes with most of its electricity needs.

The proposed improvements to the central utility plant would change the dimensions of the plant nominally. As discussed in previous sections, a new compressor station would be built and some support equipment would be installed for Alternative One and Alternative Two. Construction of the proposed actions would require the commitment of various resources. These resources include the commitment of labor, capital, energy, biological resources, building materials, and land resources. Short-term commitments of labor, capital, and fossil fuels would result directly from construction activities and indirectly from the provisions of services to the site during construction.

Long-term maintenance and operational commitments of the proposed actions would remain the same and may decrease. Alternative One and Alternative Two would result in the loss of one (1) boiler and four (4) fuel oil heaters and gain of an Ammonia injection pump, two (2) high pressure gas compressor stations and a flashtank. The facility modifications should not change maintenance requirements (Exelon Federal Services Group, October 2002). It should be noted that maintenance on the proposed gas turbines for Alternative One and Alternative Two would be performed contractually. In-house labor would not be used to service the gas turbines. Operational requirements will decrease because of the proposed actions because the equipment will be more automated.

4.8 RELATIONSHIP BETWEEN SHORT-TERM USE OF MAN'S ENVIRONMENT AND MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Short-term commitments would include labor, capital, and fossil fuels that result directly from construction and equipment installation activities and indirectly from the provision of services to the site during construction. Physical systems would be modified due to the effects of the construction and equipment installations including the topography of the area. Over the long-term, the upgraded central utility plant would provide NAVSTA Great Lakes with its electricity needs and allow NAVSTA Great Lakes to be more energy self-sufficient under Alternative One or Alternative Two. Under Alternative Three (boiler replacement), the existing boiler systems would be upgraded to be more energy efficient.

4.9 UNAVOIDABLE ADVERSE IMPACTS

Short-term impacts from construction of the proposed action would include some minor topographic alterations, minor soil disturbance and erosion, minor increases in the potential for stormwater runoff, minor increases in air emissions, and increased construction-related revenues for the area. Long-term impacts from construction and equipment installations of the proposed action include an increase in emissions, nominal increases in noise and minimal changes to the topography of the area. These long-term impacts are necessary to ensure increases in electrical capacity and electrical production requirements or improve efficiencies at the central utility plant. These unavoidable impacts for the proposed action are discussed in the various sections of this EA and are not anticipated to be significant.

4.10 BENEFICIAL IMPACTS

The central utility plant has produced steam and supplied NAVSTA Great Lakes' heating requirements. The central utility plant has served and will continue to serve a significant beneficial impact at NAVSTA Great Lakes by using and upgrading the existing facility to produce electricity, which otherwise would have to be provided by the local utility. Because the majority of the property where the central utility plant upgrades will be conducted is within the boundaries of the existing central utility plant, it is unlikely that structures providing other services could be located on the property. As long as the central utility plant upgrades provide low cost and reliable electricity, upgrading the central utility plant is a benefit for the NAVSTA Great Lakes.

5.0 COMPARISON OF ENVIRONMENTAL IMPACTS

There are five reasonable alternatives to the proposed action. The first alternative (Alternative One) is to install two (2) X 5 MW gas turbines with two (2) X 2 MW backup generators and associated equipment. The second alternative includes installing fewer combustion units (gas turbines) with increased firing rates (Alternative Two, 10MW Gas Turbine with 10MW Backup Engine). The third alternative involves replacing three (3) of the oldest boiler systems (Alternative Three, Boiler Replacement). The final alternatives for this analysis are to postpone the proposed action (Alternative Four, Postponed Action) and the No Action Alternative (Alternative Five).

5.1 ALTERNATIVE ONE, 2X5 MW GAS TURBINE WITH BACKUP ENGINE

This alternative involves installing two (2) X 5 MW gas turbine with two (2) X 2 MW backup engines and associated equipment. This alternative provides enough electricity generating capacity to supply NAVSTA Great Lakes with most of its electricity needs. This alternative does not trigger any major modification thresholds and appears to be an environmentally friendly alternative. Installing two (2) gas turbines provides redundancy capabilities that will allow the power plant to continue to operate in the event one gas turbine is shut down. This alternative is also the most economically viable when compared with Alternative Two and Alternative Three and has the shortest payback time.

5.2 ALTERNATIVE TWO, 10MW GAS TURBINE WITH 10MW BACKUP ENGINE

This alternative is to install one (1) X 10 MW gas turbine with a 10MW backup engine. This alternative does not provide the same redundancy capability as Alternative One. In the event the 10MW Gas Turbine would be shutdown, there would be only be one option to produce electricity, i.e. operate the 10MW Backup engine. The payback time for this alternative would also increase.

5.3 ALTERNATIVE THREE, BOILER REPLACEMENT

This alternative involves replacing older boiler systems including Boiler No.1, No.2 and No. 3 with new and more energy efficient boiler systems. The initial capital investment versus the energy savings and payback for replacing boiler systems do not make this an economically viable alternative when compared with Alternative One and Alternative Two. Payback for this alternative is significantly longer than Alternative Two and is nearly double the payback for Alternative One (U.S. Navy, 2003c). In addition, this alternative would trigger the major modification thresholds for NOx and carbon monoxide and would be subject to a PSD review, which would be a significant environmental impact.

5.4 ALTERNATIVE FOUR, POSTPONED ACTION

Postponing the action would implement the proposed construction schedule later in the year or in a later year. Delaying the project later in the year would lengthen the construction time significantly and the project may need to begin in winter, which would further complicate scheduling efforts. Postponing the action until later years may jeopardize the funding available for the project. Other than economic impacts and energy self-sufficiency, impacts resulting from the implementation of this alternative would be comparable to the impacts described for the proposed action.

5.5 ALTERNATIVE FIVE, NO ACTION

The No Action Alternative consists of not implementing the proposed central utility plant upgrades. Under this alternative, none of the activities described for either the proposed action or the reasonable alternatives work would be performed. Implementation of the No Action Alternative would result in no change to the existing central utility plant. NAVSTA Great Lakes would continue to be very dependent on the local utility and electricity costs will be higher than electricity that could potentially be produced on-site.

The No Action Alternative consists of not upgrading the central utility plant. Implementation of the No Action Alternative would result in no costs savings versus electricity usage and an energy savings opportunity would be forfeited. NAVSTA Great Lakes would continue to be very dependent on the local utility for electricity and may be more susceptible to future energy cost increases.

5.6 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED ANALYSIS

In addition to the proposed action and reasonable alternatives identified above, NAVSTA Great Lakes initially considered alternate technologies to increase energy production at the central utility plant. However, these alternatives were eliminated from further analysis because paybacks begin to increase significantly and in some cases, redundancy capabilities are eliminated.

Installing a 4MW gas turbine with no backup generator results in a payback that is more than double the proposed alternative. Because it takes a significant amount of time to recover the initial investment, a payback may never be realized. The equipment may be obsolete or non-operational by the time the benefits of the payback are realized. In addition, there is a risk operating equipment with no backup. During service or maintenance shutdowns, additional electrical load requirements from the local utility are very expensive and at a minimum, routine maintenance activities will need to be performed.

Another energy producing alternative that was considered includes installing a 10MW gas turbine with a 10MW backup engine. In this alternative, the steam is lowered to

125 psi (U.S. Navy, 2003c). Although operating costs are less at 125 psi, the thermal cycle is more efficient when the steam turbines operate. This alternative would result in a longer payback period.

6.0 LIST OF PREPARERS

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7.0 COORDINATION

7.1 AGENCY COORDINATION

Federal, state, and local governments and agencies were consulted prior to and during the preparation of this EA. Most agencies and government entities were either contacted in writing, by telephone, or visited during the course of the study. The agencies and government entities contacted are listed below. *Appendix J* contains agency response letters.

7.1.1 FEDERAL AGENCIES

- Natural Resources Conservation Service, Grayslake, IL
- U.S. Army Corps of Engineers, Chicago District, Chicago, IL
- U.S. Environmental Protection Agency, Region 5, Chicago, IL
- U.S. Fish and Wildlife Service, Barrington, IL
- United States Coast Guard, Burr Ridge, IL
- Federal Bureau of Investigation, North Chicago, IL

7.1.2 STATE AGENCIES

- Illinois Department of Natural Resources, Springfield, IL
- Illinois Department of Natural Resources, Bartlett, IL
- Illinois Historic Preservation Agency, Springfield, IL
- Illinois Environmental Protection Agency, Springfield, IL

7.1.3 LOCAL GOVERNMENTS AND ENTITIES

- City of North Chicago, Community Development and Planning, North Chicago, IL
- City of North Chicago – Water Plant, North Chicago, IL
- Lake County Stormwater Management Commission, Libertyville, IL
- City of Lake Forest, Lake Forest, IL
- Shields Township, Lake Forest, IL
- Village of Lake Bluff, IL

7.2 PUBLIC COORDINATION

Once the EA is finalized, a notice of availability of the EA, including findings, will be published in the Federal Register and the local media. Individuals desiring to comment on the EA will be provided a copy, or informed where a copy may be reviewed.

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Appendix A

Proposed Action
Project Area

ILLINOIS ARCHITECTURAL AND
HISTORICAL SURVEY
Map Sheet

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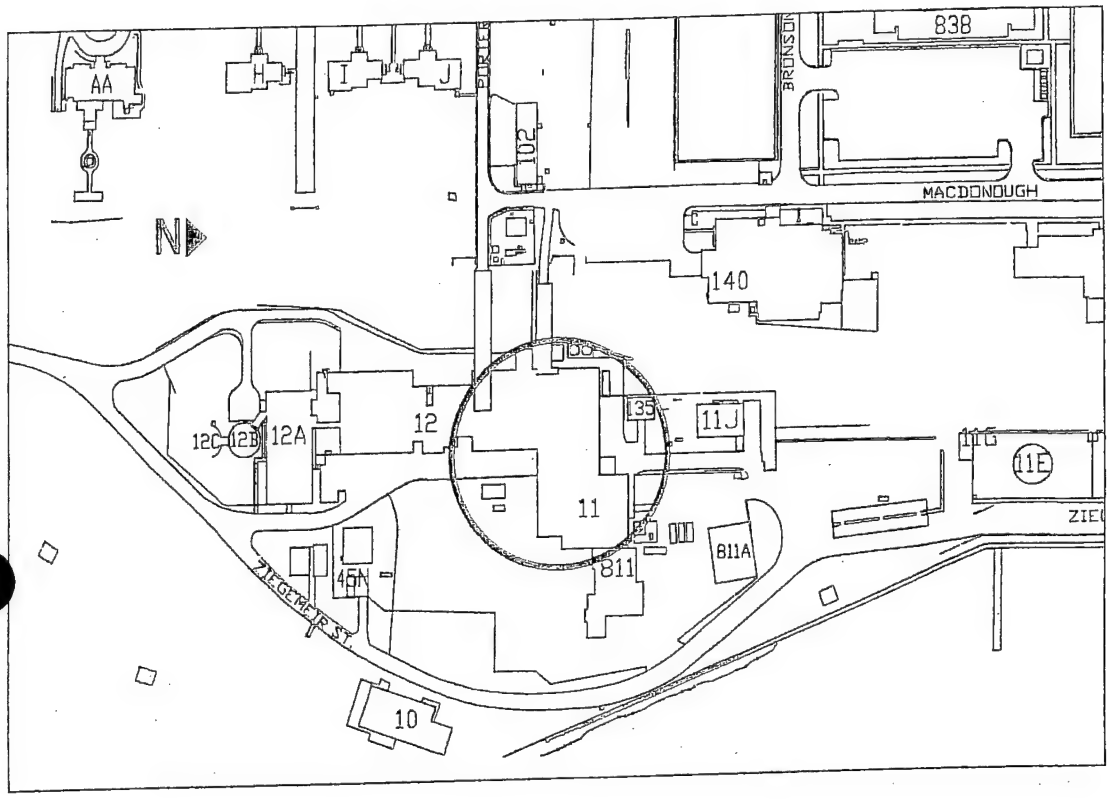
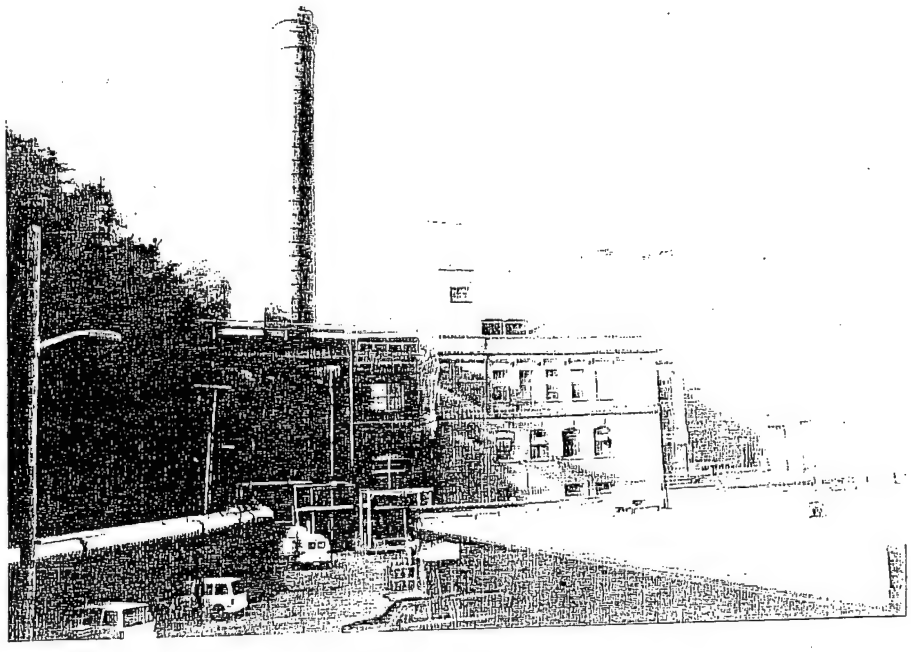
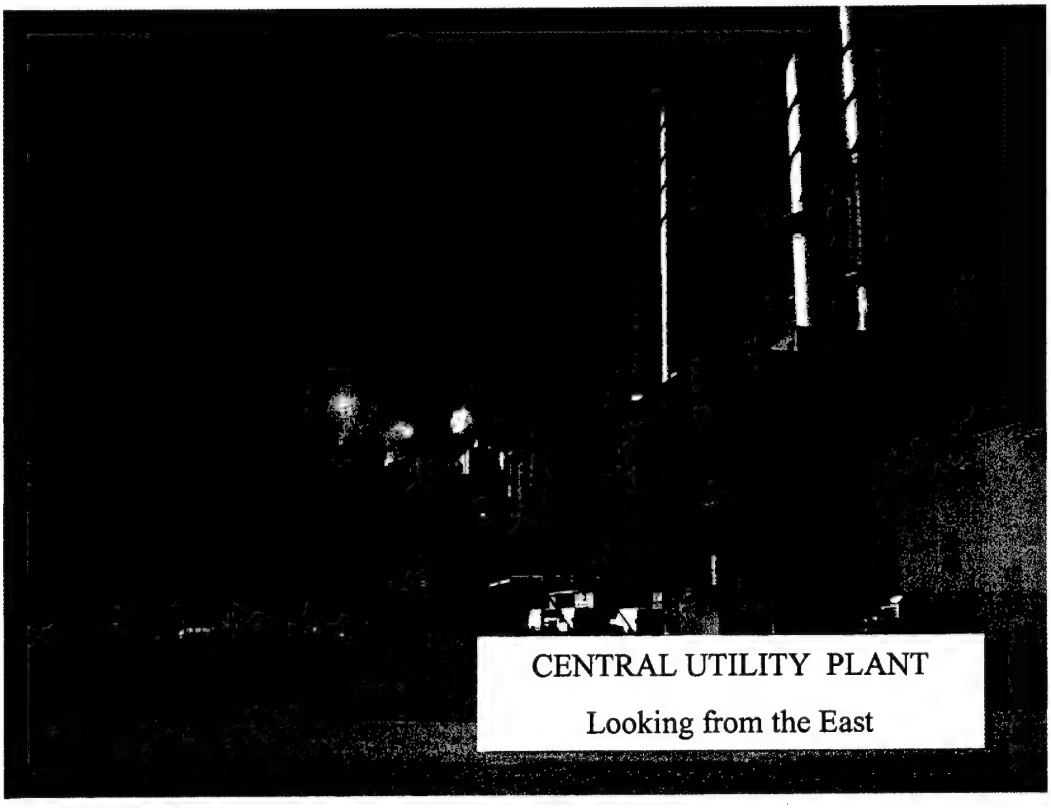
Map of Building 11





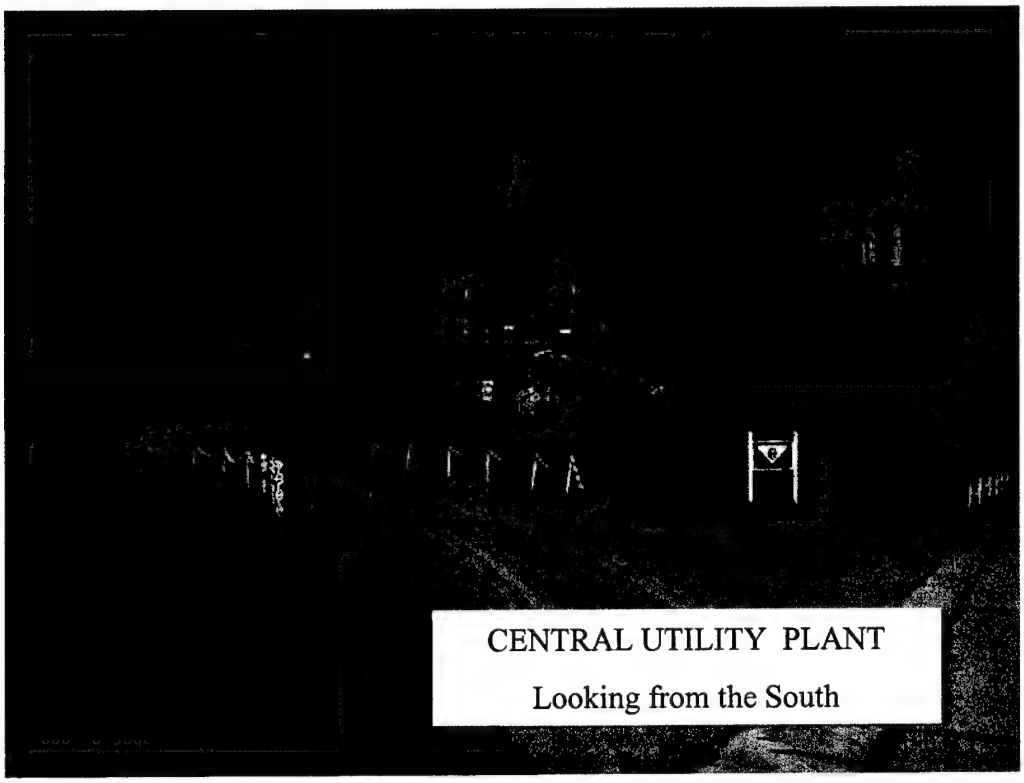
Appendix B

Photographs of the Central Utility Plant, Central Utility Plant Yard, Proposed Compressor Station location, Boiler System No. 2, Boiler System No. 3



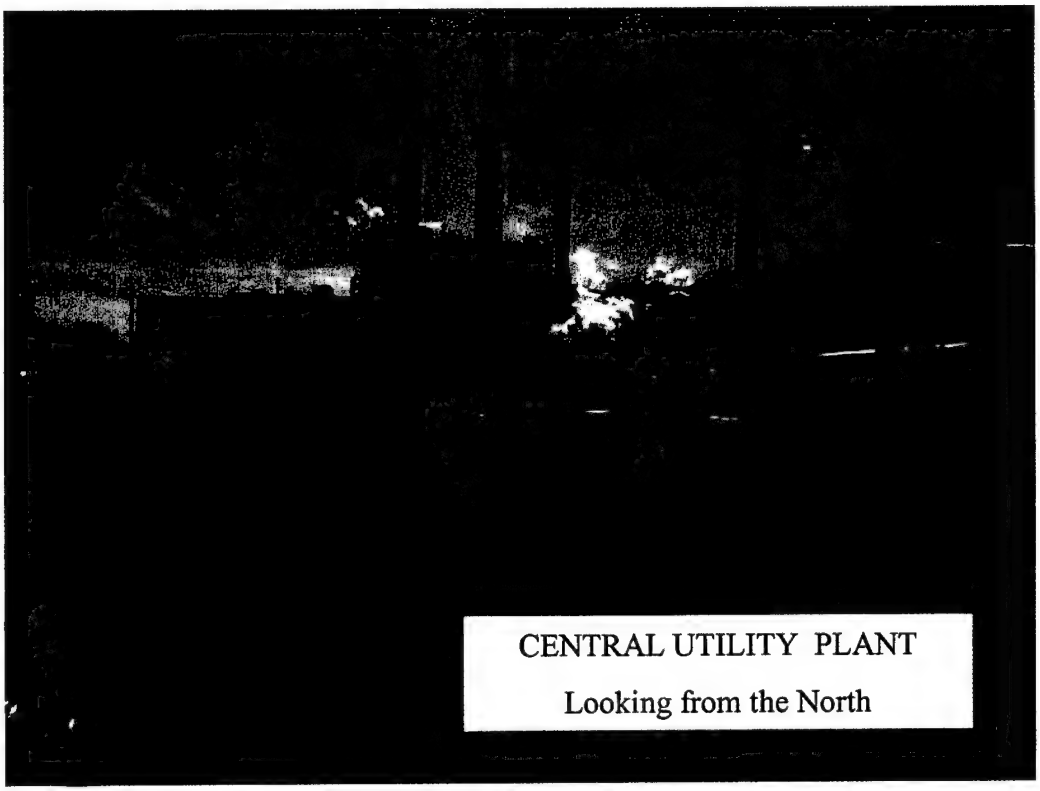
CENTRAL UTILITY PLANT

Looking from the East



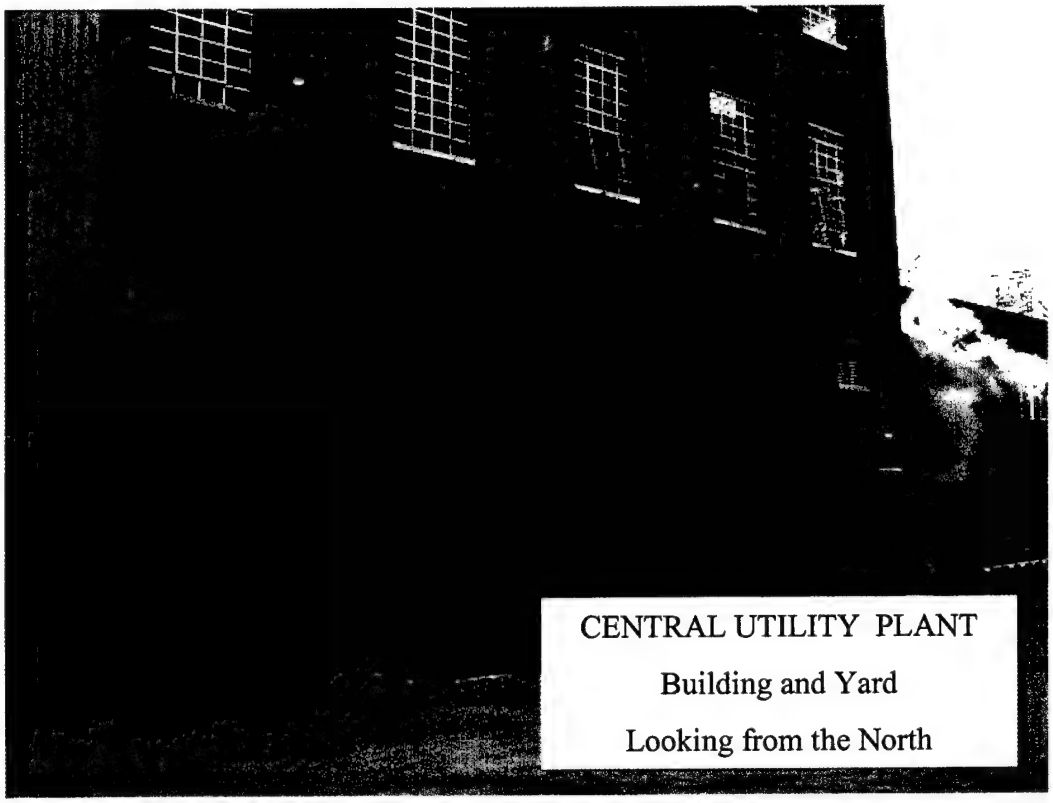
CENTRAL UTILITY PLANT

Looking from the South

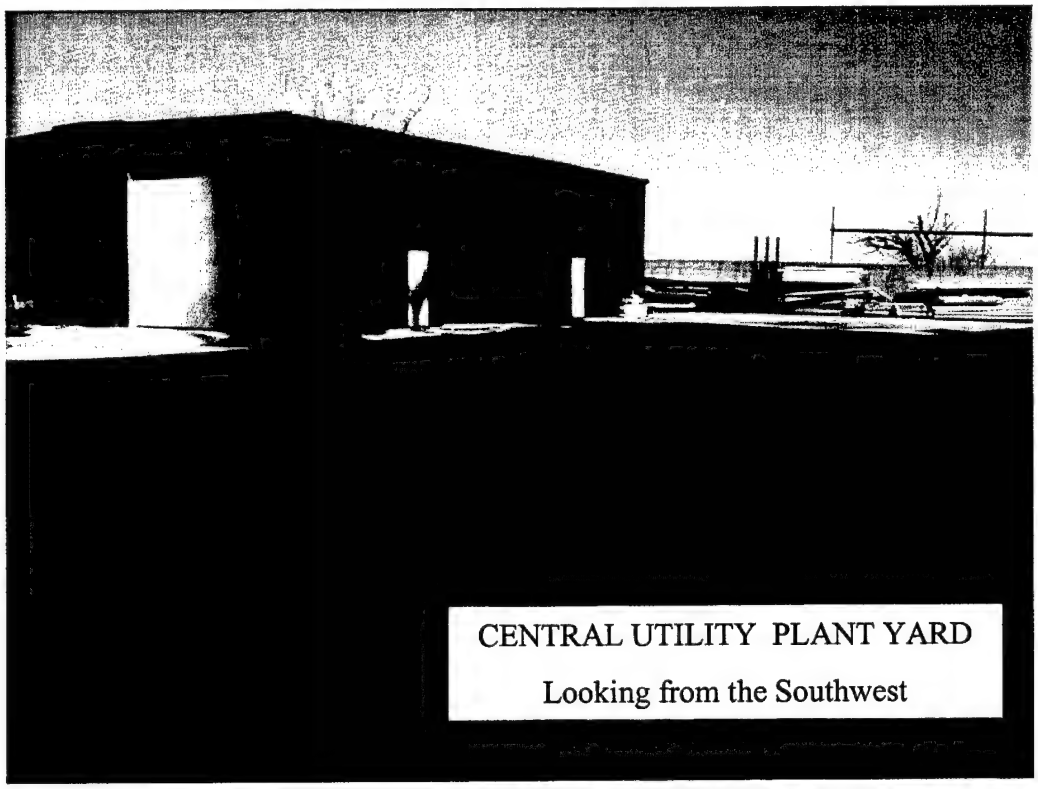


CENTRAL UTILITY PLANT

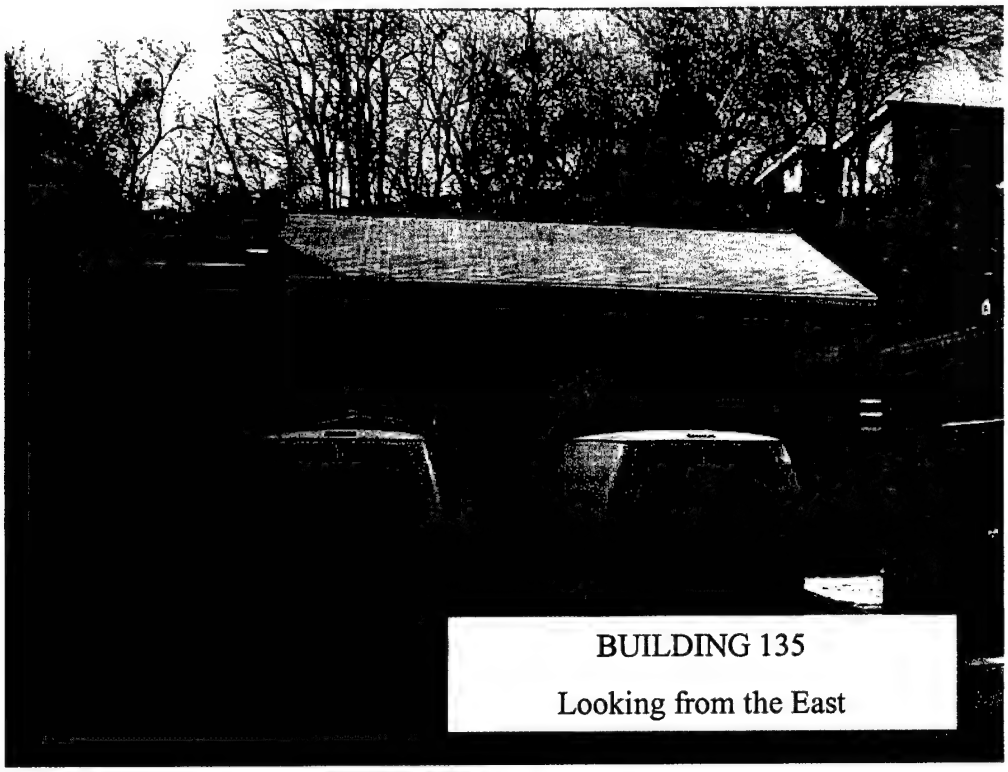
Looking from the North



CENTRAL UTILITY PLANT
Building and Yard
Looking from the North

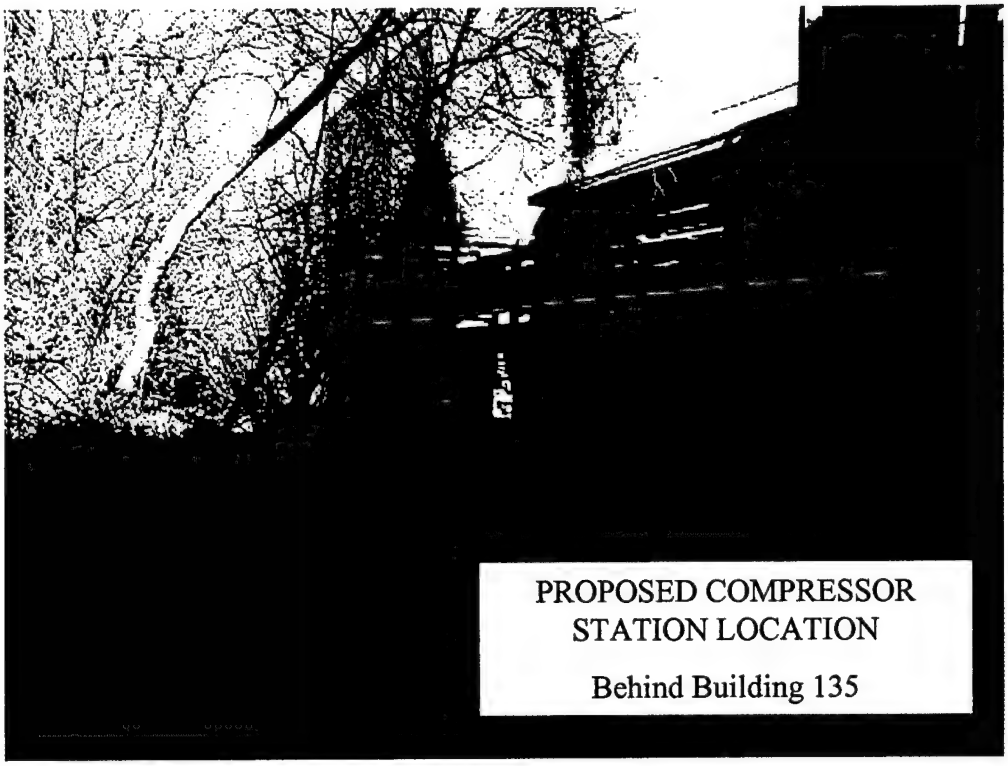


CENTRAL UTILITY PLANT YARD
Looking from the Southwest



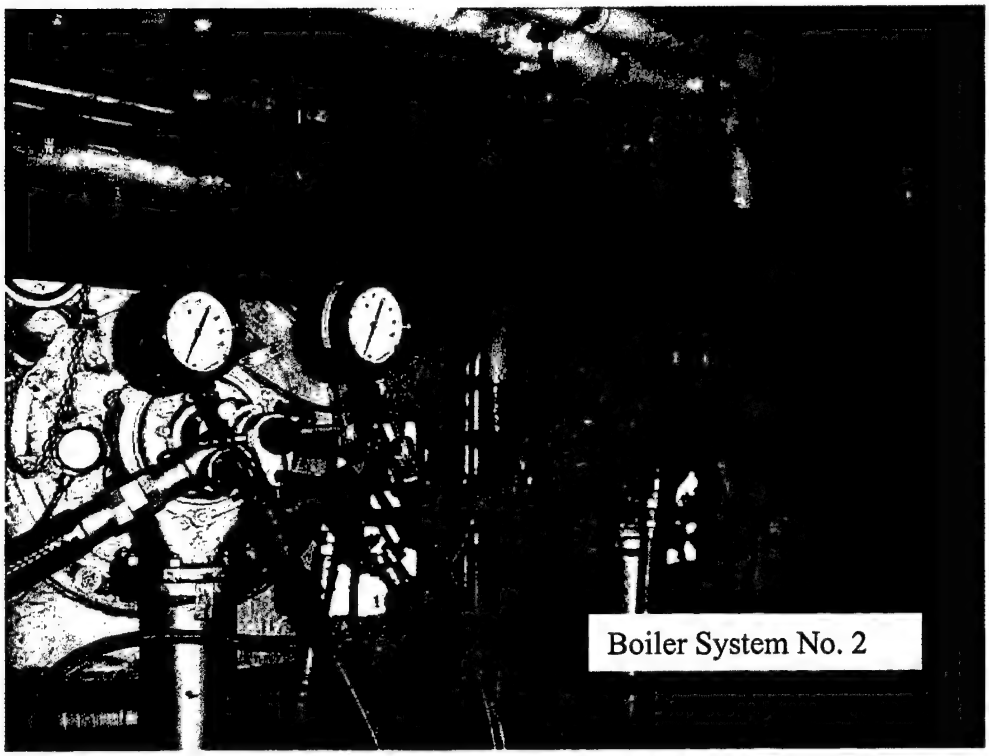
BUILDING 135

Looking from the East

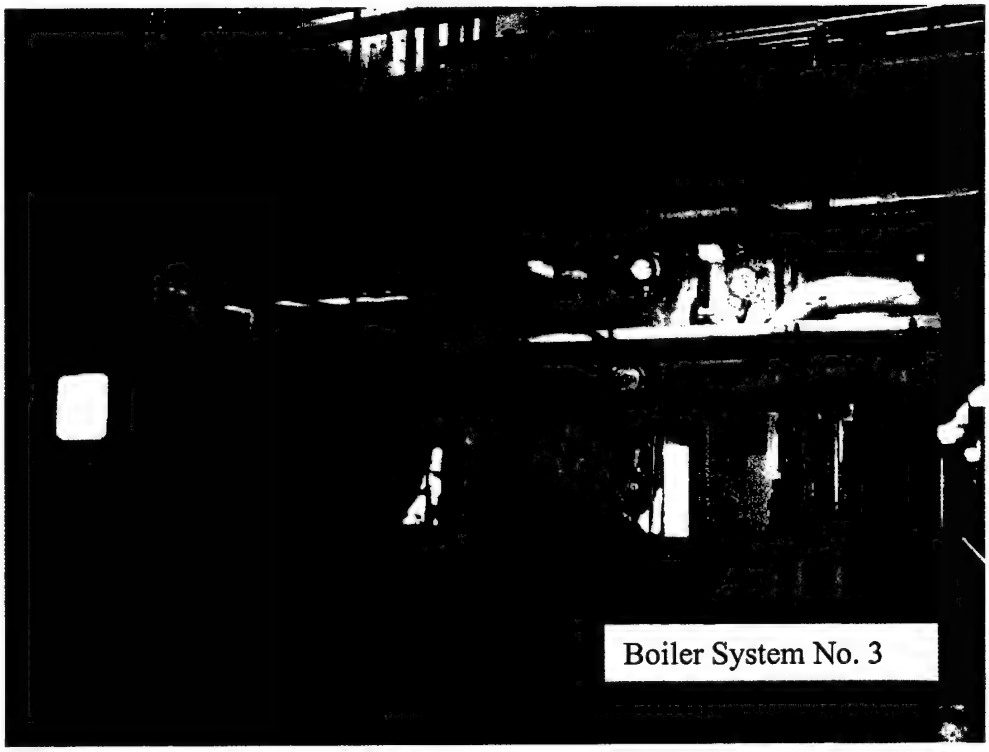


PROPOSED COMPRESSOR STATION LOCATION

Behind Building 135



Boiler System No. 2



Boiler System No. 3

Appendix C

Alternative One
Record of Non-Applicability for Clean Air Act Conformity

RECORD OF NON-APPLICABILITY FOR CLEAN AIR ACT CONFORMITY
Alternative One
Naval Training Center
Great Lakes, Illinois

I have reviewed the Environmental Assessment and attached Applicability Determination for the proposed action to construct a cogeneration facility at the central utility plant at NTC Great Lakes. The project involves installing two (2) new 5.0MW combustion turbines, two (2) new 25.0 MMBtu/hr duct burners, two (2) new selective catalytic reduction units, two (2) new 2MW backup generators and two (2) new selective catalytic reduction units for the backup generators. The project also includes converting the fuel oil storage tanks from No. 6 fuel oil to No. 2 fuel oil and permanently decommissioning three (3) existing boilers. The proposed action was evaluated with particular regard to Section 176(c) of the Clean Air Act (CAA), as amended. The legislation states that federal actions occurring in *non-attainment* or maintenance areas are required to demonstrate conformity with the air pollutant emissions policies and controls in the State Implementation Plan (SIP) before they can be implemented. Conformity is defined as conformity to the SIP purpose of eliminating or reducing the severity and number of violations of the National Ambient Air Quality Standards (NAAQS) and achieving expeditious *attainment* of such standards.

Potential air quality impacts resulting from the proposed action include air emissions generated from the proposed construction and operation of the cogeneration and fuel oil conversion projects. These activities would occur in the Metropolitan Chicago Interstate (Illinois-Indiana) Air Quality Control Region (AQCR), which is classified as a severe *non-attainment* area for ozone. Ozone is not emitted directly, but is formed in the atmosphere from a photochemical reaction between ozone precursors, primarily oxides of nitrogen (NOx) and volatile organic compounds (VOC's).

The following facts concerning this proposed action dictate that the proposed action is exempt from conformity requirements:

- The total direct and indirect VOC emissions from installing and operating the proposed cogeneration equipment, which includes emissions netting, are below the emission rates established in 40 CFR 93.153(b)(1).
- NTC Great Lakes is in attainment for the remaining non ozone precursor criteria pollutants for which a conformity determination would be required as per 40 CFR 93.153.
- The Environmental Protection Agency has granted an exemption, pursuant to Section 182(f) NOx Exemptions, from the general conformity requirements for NOx within the Lake Michigan Ozone Study modeling domain, which includes the states of Illinois, Indiana, Michigan and Wisconsin (61 Federal Register 2428-January 26, 1996).

Therefore, a formal Conformity Determination is not required.

T. F. BERRSON Capt. CEC.USN
Commanding Officer Navy Public Work Center

7/2/2003
Date

APPLICABILITY DETERMINATION FOR CONFORMITY

Cogeneration and Fuel Oil Conversion Projects
Naval Training Center
Great Lakes, Illinois

This format follows the step-by-step process outlined in OPNAVINST 5090.1B, July 30, 2001 Review Draft.

Step 1: Define the Federal action. To construct a cogeneration facility at the central utility plant and convert the fuel oil storage tanks from No. 6 fuel oil to No. 2 fuel oil and permanently decommission three (3) existing boilers.
Step 2: Is the action in an air quality *non-attainment* or maintenance area? Yes, these activities would occur in the Metropolitan Chicago Interstate AQCR, which is classified as a severe non-attainment area for ozone. Ozone is not emitted directly, but is formed in the atmosphere from a photochemical reaction between ozone precursors, primarily oxides of nitrogen (NOx) and volatile organic compounds (VOC's).
Step 3: Does the action result in the emission of criteria pollutants? Yes, it can be anticipated that NOx, VOC's, carbon monoxide, sulfur dioxide and lead would be emitted.
Step 4: Is the action (or portion of the action) exempt from conformity requirements? Yes, 1) Actions which would result in no emissions increase or an emissions increase in emissions that is clearly below thresholds contained in 40 CFR 93.153(b)(1) are not subject to conformity determinations. The total direct and indirect VOC emissions from installing and operating the proposed cogeneration equipment, which includes emissions netting, are below the emission rates established in 40 CFR 93.153(b)(1). 2) NTC Great Lakes is in attainment for the remaining non ozone precursor criteria pollutants for which a conformity determination would be required as per 40 CFR 93.153. The proposed action is not subject to conformity determination requirements because the remaining criteria pollutants (non ozone precursors) are in *attainment* status. 3) The Environmental Protection Agency has also granted an exemption, pursuant to *Section 182(f) NOx Exemptions,* from the general conformity requirements for NOx within the Lake Michigan Ozone Study modeling domain, which includes the states of Illinois, Indiana, Michigan and Wisconsin (61 Federal Register 2428-January 26, 1996). Because the total action was determined to be exempt, the analysis was stopped.

Appendix D

Alternative One
PSD Significant Emissions Increases Analysis for NOx, CO, PM10 and SO2

TABLE 5-2. PSD SIGNIFICANT EMISSIONS INCREASES ANALYSIS FOR NO_x, CO, PM_{10}, AND SO_2.

		Emissions (tpy)			
		NO_x	CO	PM_{10}	SO_2
PSD Significant Emission Rate		**40.00**	**100.00**	**15.00**	**40.00**
Potential Emissions Increases *		**42.04**	**101.34**	**9.76**	**43.76**
	Cogen Components *(GTG-1, GTG-2, DB-1, DB-2)*	25.07	99.04	8.82	41.88
	Backup Generators *(G-1, G-2)*	16.97	2.30	0.94	1.88
	Storage Tanks *(11-E, 11-K, 11-L)*	--	--	--	--
Five-Year Emissions Netting		**-9.01**	**-8.39**	*Not Required*	**-17.11**
Contemporaneous Reduction	Boiler Shutdowns *(No. 1, No. 2, & No. 3)*	-22.06	-12.62		-20.81
Permit No. 01010078	Gas Turbine Installation *(GTG1 & GTG-2)*	13.05	4.23		3.71
Permit No. 99070073	Bldg. 13 Storage Tank *(1-13-AST-1)*	--	--		--
Permit No. 99070073	Bldg. 400 Fueling Station *(400A & 400B)*	--	--		--
Net Emissions Increase		**33.03**	**92.95**	*Not Required*	**26.65**

* Potential emissions listed represent maximum potential emission rates assuming maximum operating hours and "worst-case" fuel conditions for each pollutant.

Appendix E

Alternative One
NSR Significant Emissions Increases Analysis for VOM

TABLE 5-3. NSR SIGNIFICANT EMISSIONS INCREASES ANALYSIS FOR VOM.

		VOM Emissions (tpy)
NSR Significant Emission Rate		**25.00**
Potential Emissions Increases *		**5.66**
	Cogen Components *(CT1, CT2, DB1, DB2)*	3.47
	Backup Generators *(G1, G2)*	2.00
	Storage Tanks *(11E, 11K, 11L)*	0.19
Five-Year Emissions Netting		**6.82**
Contemporaneous Reduction	Boiler Shutdowns *(No. 1, No. 2, & No. 3)*	-0.82
Permit No. 01010078	Gas Turbine Installation *(GTG1 & GTG2)*	1.25
Permit No. 99070073	Bldg. 13 Storage Tank *(1-13-AST-1)*	0.39
Permit No. 99070073	Bldg. 400 Fueling Station *(400A & 400B)*	6.00
Net Emissions Increase		**12.48**

* Potential emissions listed represent maximum potential emission rates assuming maximum operating hours and "worst-case" fuel conditions.

Appendix F

Alternative One
Sound Evaluation

SOUND EVALUATION

PLANT DESCRIPTION

A new cogeneration plant will be located in Building 11 where Boilers 1 through 3 are currently located. The noise sources from this project consist of two 5.5 MW gas turbines, two 125 HP gas compressors located outside on the north side of building, and two 2 MW diesel engine generators also located outside on the north side of Building 11. During normal operations, both gas turbines and both gas compressors will be operating at full load year round. During non-normal operation, 1 gas turbine and 1 gas compressor will be off line and both diesel engine generators will be operating at full load. Non-normal operation will occur approximately 3% of the time during maintenance periods for the gas turbine.

Outdoor noise propagation for the turbines occurs at 6 points on the roof of Building 11: 2 combustion air intake filters, 2 exhausts stacks, 1 enclosure ventilation intake, and 1 enclosure ventilation exhaust. Outdoor noise propagation for the diesel engine generators occurs at 4 points on the units: 2 engine mechanical noise and 2 engine exhausts. Refer to floor plans in Appendix I for locations.

For the purpose of this analysis, Building 140 (Port-o-Call) was selected as the nearest receptor. Building 140 is located approximately 200 feet horizontally and 80 feet vertically from the ground level where Building 11 is located. The occupancy use of Building 140 is a restaurant and meeting rooms.

SOUND LEVEL STANDARDS

In order to determine if the plant configuration will cause a significant impact on the nearest receptor, a standard noise level must be determined for comparison. Both NAVFAC and ASHRAE manuals use Noise Criteria (NC) curves to determine acceptable noise levels for different occupancy types. Below is a table showing occupancy types with listening requirements and the corresponding NC curves.

NC Standards		
Occupancy Type	Listening Conditions	NC Curve
Residences	Required for sleeping	20-30
Offices	Good	30-35
Cafeteria	Fair	35-40
Kitchens, laundries	Maximum for listening without hearing damage	45-65

For the purpose of this analysis, a NC level of 35 was selected as a standard noise level at the nearest receptor.

The table below lists noise sources and approximate sound pressure levels for relative comparison of different dB levels.

Source	Sound pressure level (dB)
Threshold of hearing	10
Whisper conversation at 3 ft	30
Window air conditioner	50
Freight train at 100 ft	70
Loud rock band	110

TECHNICAL REFERENCES

Calculations in this analysis were performed with the following references:

ASHRAE Fundamentals

ASHARE Systems

NAVFAC Design manual DM 3.14 Power plant acoustics

NAVFAC design manual DM 3.10 Noise and Vibration Control

NOISE SOURCE DATA

Noise source data was taken from both the NAVFAC power plant acoustics manual and from manufacturer's data and is listed in the table below. See *Appendix A* for calculations and manufacturer's data.

Equipment Sound Sources

Gas Turbines (sound power levels)									
	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
NAVFAC Data (casing)	113	116	118	119	119	119	119	119	119
NAVFAC Data (Inlet)	118	119	120	120	123	129	134	134	131
NAVFAC Data (exhaust)	128	132	134	134	133	131	129	125	119
NAVFAC Data (casing w/ enclosure)	107	109	110	110	109	108	107	106	105
Manufacturer's Data (Casing)	118	118	119	121	120	114	111	110	111
Manufacturer's Data (inlet)	121	124	118	116	120	124	130	151	144
Manufacturer's Data (exhaust)	120	123	120	123	126	119	112	102	93
Manufacturer's Data (w/ enclosure)	109	108	108	109	104	98	93	91	94

Diesel Engine Generator (sound power levels)									
	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
NAVFAC Data (casing)	103	111	118	118	117	119	118	112	105
NAVFAC Data (exhaust)	146	142	148	144	136	132	126	116	108
Manufacturer's Data (casing)		102	110	111	109	110	111	109	113
Manufacturer's Data (exhaust)		120	136	131	122	120	121	121	118

Gas Compressor (sound power level)									
	31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
Manufacturer's Data	54	67	77	84	90	93	94	94	92
NAVFAC Data	NA	NA	NA	NA	NA	NA	NA	NA	NA

SOUND EVALUATION STRATEGY

Outside Propagation

Starting from each noise source, the path the sound travels to the first outdoor outlet is analyzed. From the producing source to the first outdoor outlet, insertion losses are calculated for ductwork, elbows, casing, and end reflection effects. Once all outdoor sources are identified, individual sources are combined and distance effects are applied to determine the sound impact on the nearest receptor.

NOISE LEVEL ATTENUATION TO FIRST OUTDOOR OUTLET (NORMAL OPERATION)

Gas Turbine Combustion Air Intake

Noise propagates from the gas turbine casing located inside the enclosure through connected ductwork to intake filters located on the roof. An acoustical attenuator will be installed at the duct connection to the enclosure. Ductwork will be installed from the attenuator to a louvered penthouse on the roof. The interconnection ductwork will be internally lined with acoustical liner. The following was used for the calculations:

- (3) 90 degrees elbows (NAVFAC class 1 lined)
- 58 feet of 108" x 36" ductwork
- Acoustical penthouse (manufacturer's data, Appendix A)
- Roof effect (NAVFAC type 2 roof)

Gas Turbine Exhaust Stack

Noise propagates from the turbine exhaust through ductwork to the boiler and then up an exhaust stack located 192 feet above grade. The following was used for the calculations:

- (5) 90 degrees elbows (NAVFAC unlined)
- 40 feet of 42" x 42" ductwork unlined
- 152 feet of exhaust stack
- Directivity effect (NAVFAC 135 degree angle)

Gas Turbine Enclosure Ventilation Intake

The gas turbine is enclosed in an acoustical enclosure and must be ventilated to remove heat and illuminate the dangerous buildup of combustible gases. Air is pulled from a louvered penthouse located on the roof through ductwork and connecting to the enclosure. The ductwork will be internally lined with acoustical liner. In addition, a sound-attenuating elbow will be used at the connection to the enclosure. The following was used for the calculations:

- (2) 90 degree elbows (NAVFAC class 1 lined)
- 64 feet of 42 " x 42" ductwork
- Acoustical penthouse (manufacturer's data, Appendix A)
- Roof effect (NAVFAC type 2 roof)
- Gas Turbine Enclosure Ventilation Exhaust

Since air for ventilation is being pulled into the turbine enclosure, the air must be exhausted. This is accomplished by ductwork connecting from the enclosure to a louvered penthouse located on the roof. The ductwork will be internally lined with acoustical liner. In addition, a sound-attenuating elbow will be used at the connection to the enclosure. The following was used for the calculations:

- (2) 90 degree elbows (NAVFAC class 1 lined)
- 57 feet of 42 " x 84" ductwork
- Acoustical penthouse (manufacturer's data, Appendix A)
- Roof effect (NAVFAC type 2 roof)

Gas Compressor

NAVFAC data was not available; therefore, manufacturer's data was used for this calculation. The manufacturer has specified an A weighted noise pressure level of 85dB at 3 feet. The noise level specified includes an acoustical enclosure. The gas compressor will also be housed in an outdoor equipment enclosure that will add significant attenuation but was not included in these calculations.

- Directivity effect (NAVFAC 45 degrees upward)

NOISE LEVELS DISTANCE EFFECTS TO NEAREST RECEPTOR

After performing the calculation to the first outdoor outlet, the distance effects are included to determine the outdoor noise levels at the nearest receptor. Listed below are individual sound sources with effective distances to the nearest receptor.

- Gas Turbine Exhaust Stack (225 ft from receptor)
- Gas Turbine Ventilation Exhaust (located on Building 11 roof 180 ft from receptor)
- Gas Turbine Ventilation Intake (located on Building 11 roof 220 ft from receptor)
- Gas Turbine Combustion air Intake (located on Building 11 roof 200 ft from receptor)
- Gas Compressor (148 ft)

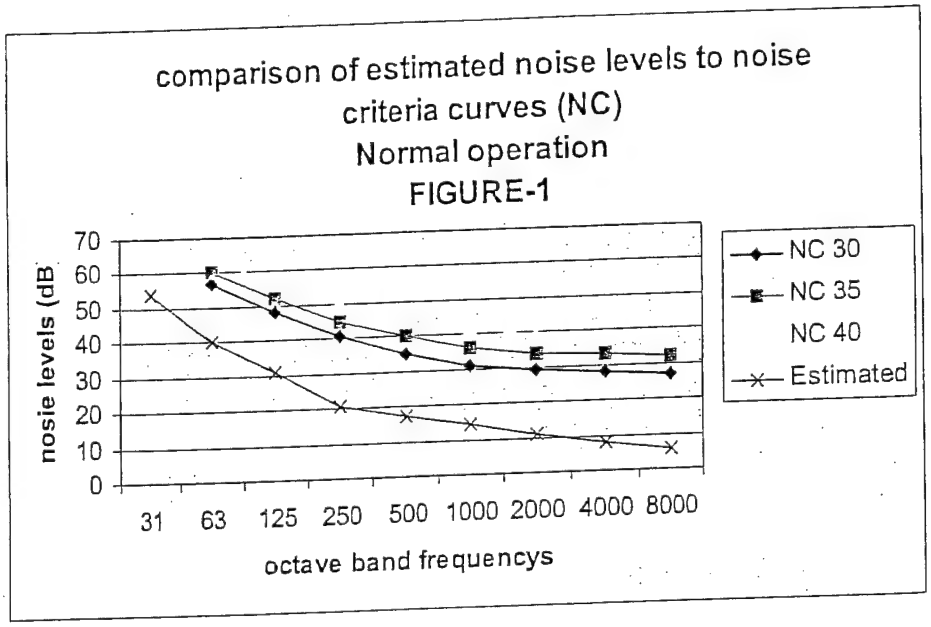
NOISE LEVEL ATTENUATION OF RECEPTOR WALL

After the individual noise sources are determined, the sound levels are summed to determine a single sound level. The noise attenuation of the walls of Building 140 is then applied to determine the sound level inside Building 140. Listed below are the results of the calculation for noise levels at the nearest receptor. In addition, the calculated sound levels are shown on Figure-1, Comparison of Estimated Noise Levels to Noise Criteria Curves (NC). For calculations of wall attenuation, the following was used:

Wall type D (NAVFAC – any typical wall construction, with closed but operable windows covering about 10 to 20% of exterior wall area)

Estimated sound pressure level inside receptor (normal operation)								
31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
54	40	31	21	17	14	11	8	6

See Comparison of Estimated Noise Levels to Noise Criteria Curves (NC) Normal Operation Figure-1



NOISE LEVEL AT FIRST OUTDOOR OUTLET (NON-NORMAL OPERATION)

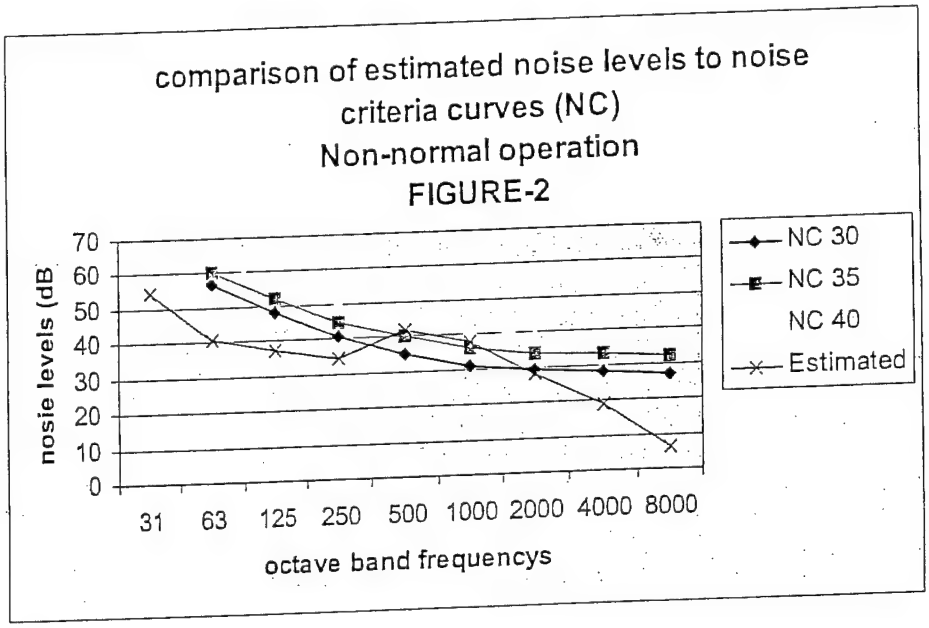
Diesel Engine Generators

In the non-normal operation mode one gas turbine/gas compressor and two diesel engines are operating. Since the gas turbine was calculated for the normal operation, only the diesel engines were considered for this section. For the calculations the following was used:

- Manufacturer supplied data for acoustical sound enclosure
- Outdoor equipment enclosure
- Directivity effect (NAVFAC 90 degrees)

Estimated sound pressure level inside receptor (non-normal operation)								
31 Hz	63 Hz	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	8000 Hz
54	41	37	34	42	38	28	19	7

See comparison of estimated noise levels to noise criteria curves (NC) non-normal operation Figure-2



Attachment A

Noise Sources

ESTIMATED SOUND POWER LEVEL OF DIESEL OR GAS RECIPROCATING ENGINE NOISE

sel Engine Generator Noise Source

engine power rating: 1571 hp

2 engine speed range:
- [ ] under 600 rpm (A=-5)
- [X] 600-1500 rpm (A=-2)
- [ ] over 1500 rpm (A=0)

3 cylinder arrang-ment:
- [ ] in-line (C=0)
- [X] V-type (C=-1)
- [ ] radial (C=-1)

4 engine fuel:
- [X] diesel and/or gas (B=0)
- [ ] natural gas only (B=-3)

5 equipped with turbocharger:
- [ ] yes (T=6)
- [ ] no (T=0)

6 air intake to unmuffled roots blower:
- [ ] yes (D=3)
- [ ] no (D=0)

(TYPICAL FOR 2 ENGINES)

7 length of air intake duct if any: 0 ft.

8 length of exhaust pipe: 30 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

part A engine casing noise

9 overall PWL (from table 2-1 NAVFAC manual)

Lw=Base PWL+A+B+C+D

= 124 + -2 + 0 + -1 + 0 = 121

10 octave frequency band adjustments (from table 2-2 for engine speed of item 2 above)

22	16	18	14	3	4	10	15	26

10a enclosure loss

4	5	5	6	6	7	8	9	10

11 octave band PWL values (item 11 = item 9 - item 10, in bands)

95	100	98	101	112	110	103	97	85

part B turbocharged air inlet noise, if applicable

12 overall PWL (from table 2-3 of NAVFAC manual (if inlet duct has acoustic lining, see item 15 below)

Lw=Base PWL - Lin^2

= [ ] - 0

= 0 dB

13 octave frequency band adjustments (from table 2-3)

14 octave band PWL values (item 14 = item 12 - item 13, in bands)

15 insertion loss of duct lining or muffler in air inlet duct, if applicable (if duct lining data are used here, eliminate the Lin^2 term in item 12 above)

16 octave band PWL radiated from intake end of air inlet duct, if applicable (item 16= item 14 - item 15)

part C engine exhaust noise

17 overall PWL (from table 2-4 of NAVFAC manual, for unmuffled exhaust)

Lw=Base PWL - T - Lex4

= 150 - 6 - 8

= 136 dB

18 octave frequency band adjustments (from table 2-4)

5	9	3	7	15	19	25	35	43

19 octave band PWL values for unmuffled engine exhaust (item 19 = item 17 - item 18, in bands)

131	127	133	129	121	117	111	101	93

20 insertion loss of muffler, if applicable, from table 3-2 or manufactures data

15	25	30	37	40	40	39	37	36

21 octave band PWL radiated from outlet of muffler exhaust (item 21 - item 19 - item 20)

116	102	103	92	81	77	72	64	57

Gas Turbine Sound Source (air inlet and exhaust stack sources)

Calculations include ductwork, elbows and directivity losses of turbine noise sources

1 engine power rating: 5 MW

2 overall PWL of unquited engine noise componets from equation 2-4, 2-5 and 2-6 or table 2-5

a. engine casing Lw =	123
b engine intake Lw =	137
c engine exhaust Lw =	140

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

part A Air inlet noise

7 octave band adjustments for unquited air inlet to engine from table 2-6

19	18	17	17	14	8	3	3	6

8 octave band PWL of unquited inlet (item 8 = item 2b - item 7, in bands)

118	119	120	120	123	129	134	134	131

9 insertion loss of 90 square turn in air path, if applicable, from table 3-9

4	9	15	18	24	27	33	36	42

10 insertion loss of ductwork, from tables

4	8	10	17	37	7	9	11	

11 directivity effect of inlet stack in direction of interest (observe correct signs)

2	4	5	8	9	12	14	16	18

12 total noise reduction if item 9 thru item 11 in direction of interest (observe correct signs)

10	21	30	43	70	46	56	63	60

13 effective PWL of inlet noise rediated in direction of interest (item 13 = item 8 - item 12)

108	98	90	77	53	83	78	71	71

part B exhaust noise

14 octave band adjustments from unquited exhaust from engine table 2-6

12	8	6	6	7	9	11	15	21

15 octave band PWL of unquited exhaust noise (item 15 - item 2c - item 14, in bands)

128	132	134	134	133	131	129	125	119

16 insertion loss of 90 square turn in air path, if applicable, from table 3-9

5	10	15	20	25	30	35	40	45

17 insertion loss of ductwork, from tables

10	21	23	30	48	32	34	26	

18 directivity effect of inlet stack in direction of interest (observe correct signs)

3	4	6	8	10	13	16	18	20

19 total noise reduction if item 9 thru item 11 in direction of interest (observe correct signs)

18	35	44	58	83	75	85	84	65

20 effective PWL of exhaust noise rediated in direction of interest (item 20 = item 15 - item 19)

110	97	90	76	50	56	44	41	54

as Turbine Sound Source (exhaust penthouse and intake penthouse sources)

Calculations include ductwork, elbows and directivity losses of turbine noise sources

1 engine power rating: 5 MW

2 overall PWL of unquited engine noise componets from equation 2-4, 2-5 and 2-6 or table 2-5

a. engine casing Lw =	123
b engine intake Lw =	137
c engine exhaust Lw =	140

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

part C engine casing noise (exhaust penthouse)

1 octave band adjustments for unquited casing

10	7	5	4	4	4	4	4	4

2 octave band PWL of unquited inlet (item 8 = item 2b - item 7, in bands)

113	116	118	119	119	119	119	119	119

3 insertion loss of 90 square turn in air path, if applicable, from table 3-9

3	6	10	12	16	18	22	24	28

4 insertion loss of ductwork, from tables

4	9	16	23	43	22	28	26	13

5 directivity effect of inlet stack in direction of interest (observe correct signs)

2	4	5	8	9	12	14	16	18

6 total noise reduction if item 9 thru item 11 in direction of interest (observe correct signs)

9	19	31	43	68	52	64	66	59

7 effective PWL of inlet noise rediated in direction of interest (item 13 = item 8 - item 12)

104	97	87	76	51	67	55	53	60

part D engine casing noise (intake penthouse)

1 octave band adjustments for unquited casing

10	7	5	4	4	4	4	4	4

2 octave band PWL of unquited inlet (item 8 = item 2b - item 7, in bands)

113	116	118	119	119	119	119	119	119

3 insertion loss of 90 square turn in air path, if applicable, from table 3-9

3	6	10	12	16	18	22	24	28

4 insertion loss of ductwork, from tables

5	11	20	32	64	31	36	33	13

5 directivity effect of inlet stack in direction of interest (observe correct signs)

2	4	5	8	9	12	14	16	18

6 total noise reduction if item 9 thru item 11 in direction of interest (observe correct signs)

10	21	35	52	89	61	72	73	59

7 effective PWL of inlet noise rediated in direction of interest (item 13 = item 8 - item 12)

103	95	83	67	30	58	47	46	60

Gas Compressor

	octave frequency band in hz								
	31	63	125	250	500	1000	2000	4000	8000
part A gas cpmpressor source									
3 octave band adjustment for unquited casing noise from table 2-6									
4 octave band PWL of unquited casing noise (item 4 = item 2a - item 3, in bands)									
5 noise reduction provided by engine casing enclosure, if applicable from table 2-7 or other data									
6 octave band PWL of enclosed engine casing (item 6 = item 4 - item 5)	85	85	85	85	85	85	85	85	85
part B incertion loss to room									
7 enclosure loss	8	9	10	11	12	13	14	15	16
8									
9									
10									
11									
12									
13 effective PWL of inlet noise rediated in direction of interest (item 13 = item 8 - item 12)	77	76	75	74	73	72	71	70	69

Attachment B

Noise Level Distance Effects to Nearest Receptor (normal operation)

as Turbine Combustion air Inlet

Calculations include distance effects of noise sources

1 distance from noise source to critical neighbor 200 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

108	98	90	77	53	83	78	71	71

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

44	44	44	44	44	45	45	46	48

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

64	54	46	33	9	38	33	25	23

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

2	4	5	8	9	12	14	16	18

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

62	50	41	25	0	26	19	9	5

Gas Turbine Ventilation exhaust

Calculations include distance effects of noise sources

1 distance from noise source to critical neighbor 180 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

104	97	87	76	51	67	55	53	60

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

43	43	43	43	43	44	44	45	45

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

61	54	44	33	8	23	11	8	15

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

2	4	5	8	9	12	14	16	18

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

59	50	39	25	0	11	0	0	0

Gas Turbine Ventilation intake

Calculations include distance effects of noise sources

1 distance from noise source to critical neighbor 220 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

103	95	83	67	30	58	47	46	60

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

45	45	45	45	45	46	46	47	49

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

58	50	38	22	0	12	1	0	11

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

2	4	5	8	9	12	14	16	18

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

56	46	33	14	0	0	0	0	0

Gas Turbine Exhaust Stack

Calculations include distance effects of noise sources

1 distance from noise source to critical neighbor 225 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

110	97	90	76	50	56	44	41	54

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

45	45	45	45	45	46	46	47	49

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

65	52	45	31	5	10	0	0	5

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

65	52	45	31	5	10	0	0	5

as Compressor

1 distance from noise source to critical neighbor 148 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

77	76	75	74	73	72	71	70	69

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

41	41	41	41	41	41	42	42	43

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

36	35	34	33	32	31	29	28	26

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

5	5	5	6	6	6	7	7	7

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

41	40	39	39	38	37	36	35	33

Attachment C

Noise Level Attenuation of
Receptor Wall
(normal operation

Summary of noise sources at nearest receptor (normal)

designation

wall or surface involved in this summation building number 140 (port-o-call)

in numbered spaces below, identify eqyipment whose noise levels contribute to total SPL at indicated wall or surface. In SPL spaces, insert SPL values at that surface due to that equipment, as taken from item 7

	octave frequency band in hz								
	31	63	125	250	500	1000	2000	4000	8000
1	GT combustion inlet								
	65	53	44	28	3	29	22	12	8
2	GT ventilation exhaust								
	62	53	42	28	3	14	3	3	3
3	GT ventilation inlet								
	59	49	36	17	3	3	3	3	3
4	GT exhaust stack								
	68	55	48	34	8	13	3	3	8
5	Gas Compressor								
	44	43	42	42	41	40	39	38	36
6									
7									
8									
9									
10									
11									
12									
13									
14									

total SPL at indicated wall or surface due to above equipment. Using decibel summation

71	59	51	43	41	40	39	38	36

71 dBA

Noise levels inside nearest receptor (normal)

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

71	59	51	43	41	40	39	38	36

9 approximate noise reduction provided by neighbor's building, summer or winter, as applicable

17	19	20	22	24	26	28	30	30

10 estimated indoor SPL at neighbor position (item 10 = item 8 -item 9)

54	40	31	21	17	14	11	8	6

11 suggested indoor noise criterion for neighbor (table 3-2) NC 35 dBA 54

12 SPL values corresponding to noise criterion of item 11 (see table 3-1)

64	60	52	45	40	36	34	33	32

13 indoor noise excess over noise criterion (item 13 - item 10 - item 12) show positive values only

	0	0	0	0	0	0	0	0

14 noise design is (from items 15 - 18 below)

[X] perfered [ ] acceptable [ ] marginal [ ] unacceptable

15 in item 14 check "perfered" if there is no noise excess in item 13

16 in item 14 check "acceptable" if item 13 excess is not more than the following amounts in any band

4	4	4	3	2	2	2	2	2

17 in item 14 check "marginal" if item 13 excess equals any of the following amounts in any band

5-7	5-7	5-7	4-6	3-5	3-5	3-5	3-5	3-5

18 in item 14 check "unaccepatble" if item 13 excess is larger than item 17 amounts in any band

Attachment D

Noise Level Distance Effect to Nearest Receptor (non-normal operation)

ESTIMATED OUTDOOR NAD INDOOR SPLAT NEIGHBOR POSITION CAUSED BY AN OUTDOOR SOUND SOURCE

Diesel Engine Generators (exhaust)

1 distance from noise source to critical neighbor 315 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

116	102	103	92	81	77	72	64	57

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

48	48	48	48	49	49	50	51	54

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

68	54	55	44	32	28	22	13	3

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

2	3	4	6	8	10	12	14	16

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

66	51	51	38	24	18	10	0	0

ESTIMATED OUTDOOR NAD INDOOR SPLAT NEIGHBOR POSITION CAUSED BY AN OUTDOOR SOUND SOURCE

Diesel Engine Generators (mechanical)

1 distance from noise source to critical neighbor 315 ft

octave frequency band in hz								
31	63	125	250	500	1000	2000	4000	8000

2 total PWL of all outdoor noise sources at source position

95	100	98	101	112	110	103	97	85

3 outdoor distance term from table 6-3 or 6-4 for item 1 distance and std-day condition

48	48	48	48	49	49	50	51	54

4 tentative outdoor SPL at distance of item 1 (item 4 = item 2 - item 3)

47	52	50	53	63	61	53	46	31

5 insertation loss of vegetation, summer or winter, as applicable

6 insertion loss of muffler from table 608, subject to apra 6-5 details

7 directivity effect (loss or gain) in direction of neighbor

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

47	52	50	53	63	61	53	46	31

Attachment E

Noise Level Attenuation of Receptor Wall (non-normal operation)

Summary of noise sources at nearest receptor (non-normal)

designation
wall or surface involved in this summation building number 140 (port-o-call)

in numbered spaces below, identify eqyipment whose noise levels contribute to total SPL at indicated wall or surface. In SPL spaces, insert SPL values at that surface due to that equipment, as taken from item 7

		octave frequency band in hz								
		31	63	125	250	500	1000	2000	4000	8000
1	GT combustion inlet	62	50	41	25	0	26	19	9	5
2	GT ventilation exhaust	59	50	39	25	0	11	0	0	0
3	GT ventilation inlet	56	46	33	14	0	0	0	0	0
4	GT exhaust stack	65	52	45	31	5	10	0	0	5
5	Gas Compressor	41	40	39	39	38	37	36	35	33
6	Diesel engine generators (exhaust)	69	54	54	41	27	21	13	3	3
7	Diesel engine generators (mechanical noise)	50	55	53	56	66	64	56	49	34
8										
9										
10										
11										
12										
13										
14										

total SPL at indicated wall or surface due to above equipment. Using decibel summation

31	63	125	250	500	1000	2000	4000	8000
71	60	57	56	66	64	56	49	37

74 dBA

Noise levels inside nearest receptor (non-normal)

8 estimate outdoor SPL at neighbor position (item 8 = item 4 - item 5 - item 6 + item 7)

71	60	57	56	66	64	56	49	37

9 approximate noise reduction provided by neighbor's building, summer or winter, as applicable

17	19	20	22	24	26	28	30	30

10 estimated indoor SPL at neighbor position (item 10 = item 8 -item 9)

54	41	37	34	42	38	28	19	7

11 suggested indoor noise criterion for neighbor (table 3-2) NC | 35 | dBA | 55

12 SPL values corresponding to noise criterion of item 11 (see table 3-1)

64	60	52	45	40	36	34	33	32

13 indoor noise excess over noise criterion (item 13 - item 10 - item 12) show positive values only

	0	0	0	2	2	0	0	0

14 noise design is (from items 15 - 18 below)

	perfered		acceptable		marginal		unacceptable
		X					

15 in item 14 check "perfered" if there is no noise excess in item 13

16 in item 14 check "acceptable" if item 13 excess is not more than the following amounts in any band

4	4	4	3	2	2	2	2	2

17 in item 14 check "marginal" if item 13 excess equals any of the following amounts in any band

5-7	5-7	5-7	4-6	3-5	3-5	3-5	3-5	3-5

18 in item 14 check "unaccepatble" if item 13 excess is larger than item 17 amounts in any band

Appendix G

Building 11
Asbestos Inspection

United
Analytical
Services, Inc.
A Women Owned Business

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
PHONE: (630) 691-UAS1 (8271)
FAX: (630) 691-1819
E-Mail: uasinc@uas1.com

January 23, 2003

Mr. Claude Monroe
Senior Project Manager
Exelon Services Inc.
1820 Midpark Road, Suite C
Knoxville, TN. 37921-5995

Re: **Limited Asbestos NESHAPS Building Inspection and Analytical Services:**
Great Lakes Naval Training Center Phase 9, Distribution Improvements
Building 11,Great Lakes, Illinois

UAS Project 0391020-01

Dear Mr. Monroe:

The following will serve as United Analytical Services, Inc. final report for the asbestos building inspection performed at your request at the above referenced location.

The inspection was performed by Messrs. Aaron Villegas (IDPH 100-06570) and Stefan Clouse (IDPH 100-09199), Illinois Department of Public Health Licensed Building Inspectors.

The purpose of the inspection was to collect and analyze information in order to make sound judgements regarding potential asbestos hazards. The inspection was also performed to identify asbestos containing materials prior to building renovation/demolition activities. At Exelon's request, the inspection was limited to specific interior mechanical system materials associated with Boilers one (1), two (2), three (3), and the fuel oil pump and heater skid. All sampling was performed within the Phase A abatement area, as noted on the floor plans provided by Exelon. Suspect asbestos materials were identified during the inspection.

It was reported to UAS that asbestos survey(s) had previously been performed within the affected area. Following these inspections, numerous materials within the affected area had been labeled as "asbestos" or "non-asbestos". UAS' limited inspection included the sample collection of materials where no labeling was evident, or on materials that had been previously labeled as "non-asbestos". Materials that had been previously identified as asbestos were not subject to this inspection.

These objectives were sought only for the areas specified by the client where renovation activities were planned. From hereinafter the subject site for this investigation will be known as Great Lakes Naval Training Center Building 11.

The inspection and analysis was performed as follows:

Asbestos Containing Materials Inspection Methodology

The survey looked for suspect asbestos containing materials through on-site investigation and observation only. No exploratory demolition was performed.

For this investigation existing boilers one (1), two(2), three (3), and fuel oil pump and heater skid were treated as individual systems. The boilers and fuel pump and heater skids were visually inspected for the identification and quantities of homogeneous types of suspect asbestos materials.

1. Bulk Sampling Strategy

   a. A visual inspection was conducted to identify categories of homogeneous types of suspect materials, or target materials, from specified areas.

   b. A minimum of three (3) bulk sample of each type of category of homogeneous material were collected following the EPA Purple Book Protocol.

   c. A positive analysis for asbestos on a single sample would define the homogeneous area as an ACM.

2. United Analytical Services. Inc. Standard Operating Procedures

   a. Suspect ACM was not unnecessarily disturbed for sampling.

   b. A NIOSH approved respirator equipped with HEPA filters was worn during bulk sampling of friable materials.

   c. A core was removed by gently cutting and penetrating all layers of the material, including paint and protective coatings.

   d. Each sample was placed in a plastic laboratory bag and labeled with a discrete sample I.D. number.

3. Polarized Light Microscopy (PLM) Bulk Analysis

   Bulk samples were analyzed for asbestos in accordance with the guidelines contained in the EPA Test Method for the determination of Asbestos in Bulk Building Materials (EPA/600/R-93/116, July 1993) and the two most recent Federal Register notices describing the analysis of asbestos

in layered building materials and an advisory regarding the availability of an improved asbestos bulk sample test method. These notices include: 1) the 01/05/94, "Asbestos NESHAP Clarification Regarding Analysis of Multi-layered Systems describing the NESHAP policy that layers must be analyzed and reported separately, and 2) the 08/01/94, "Advisory Regarding Availability of an Improved Asbestos Bulk Sample Test Method; Supplementary Information on Bulk Sample Collection and Analysis" announcing the availability of the new bulk sample analysis method for the AHERA program, "Method for the Determination of Asbestos in Bulk Building Materials".

The stain dispersion analysis method was used. The percentages of the materials were estimated using both a stereo microscope and a polarized light microscope (PLM). Identifying morphology include morphology, color and pleochroism, refractive indices, birefringence, extinction characteristics, elongation, and stain dispersion colors.

4. Laboratory Accreditation

The samples were analyzed by UAS, Downers Grove, Illinois. UAS is accredited for PLM analysis by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program (NVLAP), as well as The American Industrial Hygiene Association (AIHA).

Inspection Limitations

Our investigation was performed using the degree of care and skill ordinarily exercised under similar circumstances by reputable environmental consultants practicing in this or other localities. The information in this report is deemed reliable but there cannot be a guarantee that all hazardous or potentially hazardous conditions have been located or identified. Some of the reasons for this are:

1. The inspection conducted was not an Asbestos Hazard Emergency Response Act (AHERA) inventory. Therefore, all ACMs may not have been identified.

2. When sampling was conducted, it was performed on a random basis and the material sampled was assumed to be homogeneous. The possibility does exist that material composition may differ from the sampling location.

3. Unless specifically noted, our findings and areas we selected to be sampled are based on visual observations. Materials and conditions which are concealed or are inaccessible may not have been discovered.

4. Non-friable suspect ACM have been sampled unless specifically noted. Examples of non-friable materials include floor tile, transite products, roofing materials, mastics and adhesives. While most non-friable materials do not generate fiber release under normal conditions, they cannot be ignored if they are to be altered.

5. When possible, multiple samples should be collected to minimize error. There is a chance that

human error will create inconsistencies. If abatement is deemed necessary, a more detailed survey of the homogeneous area is recommended, or the incorporation of additional, previous, or more comprehensive studies to further define which portions are ACM and to prepare design drawings and bid documents.

6. Some conclusions are in part or whole based on verbal information provided to us by others. False or misleading statements cannot always be detected.

7. A negative sample result does not comply with EPA/IEPA/NESHAPS for determination of an asbestos containing material. A minimum of three (3) samples of a given suspect material must be collected and determined to be none detected for asbestos in order to be considered "non-asbestos".

General Information

A total of thirty-seven (37) homogeneous areas of suspect asbestos containing materials were identified during the inspection. A total of one-hundred-fifteen (115) samples were collected during the inspection. A total of ninety-three (93) samples were analyzed by Polarized Light Microscopy (PLM).

Eleven (11) homogeneous areas located in the ground floor level under boilers 1,2,&3, boiler #2 ID fan level, and fuel oil pump and heater skid under boiler # 5 were found to be asbestos containing. All of the identified suspect materials and sample analysis data are represented in the attached tables. Specific locations for each sample are identified in the attached drawings.

As long as these materials remain intact and the integrity of the materials is not compromised they may be managed in place without representing a hazard to the building or its occupants. Should the need arise to remove or disturb these materials, a licensed asbestos abatement contractor should be employed following all applicable state, federal, and local regulations.

It has been a pleasure serving your environmental needs. If you have any questions regarding this report please do not hesitate to call. Thank you.

Sincerely,
United Analytical Services, Inc.

Aaron Villegas

attachments

03.av.glntc.bldg.11.020

LIMITED ASBESTOS NESHAPS BUILDING INSPECTION SERVICES
GREAT LAKES NAVAL TRAINING CENTER
BUILDING 11
BOILERS ONE, TWO, THREE, AND FUEL OIL PUMP & HEATER SKID
GREAT LAKES, ILLINOIS

UAS PROJECT 0391020-01

JANUARY, 2003

Prepared for:

Mr. Claud Monroe
Exelon Services, Inc.
1820 Midpark Road, Suite C
Knoxville, TN. 37921-5995

COMPREHENSIVE
LIMITED ASBESTOS NESHAPS BUILDING INSPECTION
FOR
GREAT LAKES NAVAL TRAINING CENTER
BUILDING 11
GREAT LAKES, ILLINOIS

TABLE OF CONTENTS

APPENDIX A
POLARIZED LIGHT MICROSCOPY (PLM) BULK ANALYSIS

United Analytical Services, Inc

Client: Exelon
Building Location: Building 11
City: Great Lakes State: Illinois
Date: January 17th, 2003
Turn Around Time: 2-4hr 6-8hr 24hr **2day** 3day 5day
Comments:

Building Materials Survey Table

UAS Project # 0391020-01 Lab 037474
Surveyor: Aaron Villages
IDPH#: 100 - 06570
Page: 1 of 4
Analyze Until Positive: **Yes** / No

ID	Material	Location	Asbestos Containing		NESHAPS Classification					Hazard Assessment
			Yes	No	Friable	Non-Friable		Quantities	Damage	
						Cat 1	Cat 2			
TPA	Hot Water Pipe	Basement SW Corner	X		X			~70LF	NO	NESHAPS
TDA	Cyclone Collectors 1 - 3	Basement	X		X			~4000SF	NO	NESHAPS
TDB	Twin Ducts 1 - 3	Basement	X		X			~2400SF	NO	NESHAPS
TBA	Boiler #1 Door Lining	Basement		X			X	~20SF	YES	NONE
TBB	Steal Drum	Boiler #3 1st & 3rd Floor		X	X			~22SF	NO	NONE
TPB	Steam Pipe Wrap (West)	1st Floor		X	X			~300LF	NO	NONE
TPC	Oil Pipe Wrap (West)	1st Floor		X	X			~300LF	NO	NONE
TJA	2" Pipe Wrap (Joint)	West of Boiler #1 1&2 Fl		X	X			~6lf	NO	NONE
MMA	Fire Brick	2nd Floor Boiler #1		X			X	UNKNOWN	NO	NONE

ACM - Asbestos Containing Material
NONE - No Regulated Quantities of Asbestos Detected, No Response Required
NESHAPS - National Emissions Standard for Hazardous Air Pollutants
~Quantities are Approximate

SF - Square Feet
LF - Linear Feet
CF- Cubic Feet

Relinquished By: Aaron Villages Time/Date: 1/20/03 Received: Karla Smith-Kasten Time/Date: 1/20/03

United Analytical Services, Inc

Client: Exelon
Building Location: Building 11
City: Great Lakes State: Illinois
Date: January 17th, 2003
Turn Around Time: 2-4hr 6-8hr 24hr **2day** 3day 5day
Comments:

Building Materials Survey Table

UAS Project # 0391020-01 Lab 037474
Surveyor: Aaron Villages
IDPH#: 100 - 06570
Page: 2 of 4
Analyze Until Positive: **Yes** / No

ID	Material	Location	Asbestos Containing		NESHAPS Classification					Hazard Assessment
			Yes	No	Friable	Non-Friable		Quantities	Damage	
						Cat 1	Cat 2			
MMB	Boiler Gasket	2ND Floor Boiler #1	X		X			~25LF	NO	NESHAPS
TDC	Canvas Boiler Duct Wrap	1st Floor Boiler #1		X	X			~100LF	NO	NONE
TBC	Steam Drum Insulation	3rd Floor Boiler #1		X	X			~104SF	NO	NONE
TBD	Steam Drum	1st Floor Boiler #1		X	X			~22SF	NO	NONE
TBE	Steam Drum	1st & 3rd Fl Boiler #1		X	X			~22SF	NO	NONE
TDD	Boiler Duct Insulation	1, 2, 3 Fl Boiler #2		X	X			~150LF	NO	NONE
TBF	Steam Drum Insulation	3rd Floor Boiler #2		X	X			~104LF	NO	NONE
TPD	Canvas Pipe Wrap	2nd / 3rd Boiler #2		X	X			~100LF	NO	NONE
TDE	Boiler Duct Insulation	1st/ 2nd/ 3rd Boiler #3		X	X			~150LF	NO	NONE

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NONE - No Regulated Quantities of Asbestos Detected, No Response Required
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United Analytical Services, Inc

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Comments:

Building Materials Survey Table

UAS Project # 0391020-01 Lab 037474
Surveyor: Aaron Villages
IDPH#: 100 - 06570
Page: 3 of 4
Analyze Until Positive: **Yes** / No

ID	Material	Location	Asbestos Containing		NESHAPS Classification					Hazard Assessment
			Yes	No	Friable	Non-Friable Cat 1	Non-Friable Cat 2	Quantities	Damage	
TJB	2" Joint Insulation	Boiler #3 3rd Floor		X	X			~15LF	NO	NONE
TJC	6" Pipe Joint Canvas Ins	Boiler #3 2nd / 3rd		X	X			~401LF	NO	NONE
TBG	Steam Drum Insulation	3rd Floor Boiler #3		X	X			~104SF	NO	NONE
MMC	Fire Brick	Boiler #2		X				UNKNOWN	NO	NONE
MMD	Fire Brick	Boiler #3		X				UNKNOWN	NO	NONE
TJD	Joint Insulation	Heat Supply North Wall		X	X			~3LF	YES	NONE
TPE	Pipe Wrap	Heat Supply North Wall		X	X			~150LF	NO	NONE
TJE	Pipe Joint Canvas	Basement Compressor Room		X	X			2 elbows	NO	NONE
TPF	Pipe Wrap	Oil Line 1st Floor West Wall		X	X			~500LF	NO	NONE

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CF- Cubic Feet

Relinqu[redacted] P· *Aaron Villages* Time/Date: 1/20/03 Receive[redacted] *Carla Smith-Kasten* Time/Date: 1/20/03 [redacted]

United Analytical Services, Inc

Client: Exelon
Building Location: Building 11
City: Great Lakes State: Illinois
Date: January 17th, 2003
Turn Around Time: 2-4hr 6-8hr **24hr** 2day 3day 5day
Comments:

Building Materials Survey Table

UAS Project # 0391020-01 Lab 037474
Surveyor: Aaron Villages
IDPH#: 100 - 06570
Page: 4 of 4
Analyze Until Positive: Yes / No

ID	Material	Location	Asbestos Containing		NESHAPS Classification					Hazard Assessment
			Yes	No	Friable	Non-Friable		Quantities	Damage	
						Cat 1	Cat 2			
TJF	Pipe Joint Wrap	Make Up Water 1st Floor West Wall		X	X			~25LF	NO	NONE
TTA	Tank Insulation	West Heater Basement	X		X			~85LF	NO	NESHAPS
TTB	Tank Insulation	East Heater Basement	X		X			~85LF	NO	NESHAPS
TPG	Pipe Run	Oil Return Basement		X	X			~150LF	NO	NONE
TPM	Pipe Run	Oil Suction Basement		X	X			~150LF	NO	NONE
TPI	Pipe Run	Oil Pressure Release Basement	X		X			~50LF	NO	NESHAPS
TJG	Pipe Joint	Oil Return Line	X		X			~15LF	NO	NESHAPS
TJH	Pipe Joint	Oil Suction Line	X		X			~15LF	NO	NESHAPS
TPJ	Pipe Insulation	10" Steam Line	X		X			~60LF	NO	NESHAPS
TJI	Pipe Joint	Fuel Oil Line	X		X			~50LF	NO	NESHAPS

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~Quantities are Approximate

SF - Square Feet
LF - Linear Feet
CF- Cubic Feet

Relinqu[redacted] P Aaron Villages Time/Date: 1/20/03 Receiv[redacted] Y 'a Smith-Kasten Time/Date: 1/20/03

Inited
Analytical
Services, Inc.

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TPA-1	037474 01	White	Hot Water Pipe	CHRY	35	CELL	10	0	55
TDA-1	037474 04	Gray	Cyclone Collectors	CHRY AMOS	20 20	CELL FBG	20 20	0	20
TDB-1	037474 07	Gray	Twin Ducts	CHRY AMOS	15 20	CELL FBG	10 25	0	30
TBA-1	037474 10	Orange	Boiler #1 Lining	--	ND	--	ND	0	100
TBA-2	037474 11	Orange	Boiler #1 Lining	--	ND	--	ND	0	100
TBA-3	037474 12	Orange	Boiler #1 Lining	--	ND	--	ND	0	100

Analysis Comments:

Samples analyzed according to the EPA/600/R-93 166 July 1993
entitled Method for the Determination of Asbestos in Bulk Building Materials
Further testing by gravimetric or TEM Methods are recommended
for samples that are non-friable, i.e., floor tiles, mastics, etc.
Report shall not be reproduced except in full, without
the written approval of the laboratory.
Laboratory results pertain to those delivered for analysis.
Samples will be discarded if not notified by the client within 90 days.

CODES (ASBESTOS)	CODES (OTHER FIBERS)	CODES (MATRIX)
ND-NONE DETECTED	FBG-FIBER GLASS	G-GYPSUM
CHRY-CHRYSOTILE	CELL-CELLULOSE	C-CALCIUM CARBONATE
AMOS-AMOSITE	SYN-SYTHETIC	M-MICA
CROC-CROCIDOLITE	WOLL-WOLLASTONITE	O-OTHER MATRIX
TREM-TREMOLITE	H-HAIR	
ACTN-ACTINOLITE	O-OTHER (SPECIFY)	
ANTH-ANTHOPHYLLITE		

ANALYZED BY-Karla Smith-Kasten

January 21, 2003
DATE ANALYZED

PLM & TEM
NVLAP
NVLAP Laboratory # 101732

PCM
AIHA Laboratory # 101212

United
Analytical
Services, Inc.

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TBB-1	037474 13	Beige	Steam Drum	--	ND	CELL FBG	15 25	0	60
TBB-2	037474 14	Beige	Steam Drum	--	ND	CELL FBG	15 30	0	55
TBB-3	037474 15	Beige	Steam Drum	--	ND	CELL FBG	10 30	0	60
TBB-4	037474 16	Beige	Steam Drum	--	ND	CELL FBG	10 50	0	40
TPB-1	037474 17	Silver	Steam Pipe Wrap	--	ND	CELL FBG	75	0	25
TPB-2	037474 18	Silver Yellow	Steam Pipe Wrap	--	ND	CELL FBG	90	0	10

Analysis Comments:

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CHRY-CHRYSOTILE
AMOS-AMOSITE
CROC-CROCIDOLITE
TREM-TREMOLITE
ACTN-ACTINOLITE
ANTH-ANTHOPHYLLITE

CODES (OTHER FIBERS)
FBG-FIBER GLASS
CELL-CELLULOSE
SYN-SYTHETIC
WOLL-WOLLASTONITE
H-HAIR
O-OTHER (SPECIFY)

CODES (MATRIX)
G-GYPSUM
C-CALCIUM CARBONATE
M-MICA
O-OTHER MATRIX

ANALYZED BY-Karla Smith-Kasten

January 21, 2003
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630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TPB-3	037474 19	Yellow Silver	Steam Pipe Wrap	–	ND	FBG	90	0	10
TPC-2	037474 20	Silver	Oil Pipe Wrap	–	ND	FBG	80	0	20
TPC-3	037474 21	Silver	Oil Pipe Wrap	–	ND	FBG	80	0	20
TPC-4	037474 22	Silver	Oil Pipe Wrap	–	ND	CELL FBG	75 10	0	15
TJA-1	037474 23	Off White	2" Pipe Wrap	–	ND	FBG	90	0	10
TJA-2	037474 24	Off White	2" Pipe Wrap	–	ND	FBG	90	0	10

Analysis Comments:

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CROC-CROCIDOLITE	WOLL-WOLLASTONITE	O-OTHER MATRIX
TREM-TREMOLITE	H-HAIR	
ACTN-ACTINOLITE	O-OTHER (SPECIFY)	
ANTH-ANTHOPHYLLITE		

ANALYZED BY-Karla Smith-Kasten

January 21, 2003
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Downers Grove, IL 60515-1770
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PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJA-3	037474 25	Off White	2" Pipe Wrap	--	ND	FBG	95	0	5
MMA-1	037474 26	Beige	Fire Brick	--	ND	--	ND	0	100
MMA-2	037474 27	Beige	Fire Brick	--	ND	--	ND	0	100
MMA-3	037474 28	Beige	Fire Brick	--	ND	--	ND	0	100
MB-1	037474 29	Silver White	Boiler Gasket	CHRY	70	CELL	20	0	10
TDC-1	037474 32	Silver Beige	Canvas Boiler Duct Wrap	--	ND	FBG	85	0	15

Analysis Comments:

Samples analyzed according to the EPA/600/R-93 166 July 1993
entitled Method for the Determination of Asbestos in Bulk Building Materials
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CODES (OTHER FIBERS)
FBG-FIBER GLASS
CELL-CELLULOSE
SYN-SYTHETIC
WOLL-WOLLASTONITE
H-HAIR
O-OTHER (SPECIFY)

CODES (MATRIX)
G-GYPSUM
C-CALCIUM CARBONATE
M-MICA
O-OTHER MATRIX

ANALYZED BY-Karla Smith-Kasten

January 22, 2003
DATE ANALYZED

PLM & TEM
NVLAP Laboratory # 101732

PCM
AIHA Laboratory # 101212

United
Analytical
Services, Inc.

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TDC-2	037474 33	Silver Beige Yellow	Canvas Boiler Duct Wrap	--	ND	FBG	95	0	5
TDC-3	037474 34	Silver Beige Yellow	Canvas Boiler Duct Wrap	--	ND	FBG	95	0	5
TBC-1	037474 35	Gray	Steam Drum Insulation	--	ND	CELL FBG	3 10	0	87
TBC-2	037474 36	Gray	Steam Drum Insulation	--	ND	CELL FBG	10 20	0	70
TBC-3	037474 37	Gray	Steam Drum Insulation	--	ND	CELL FBG	5 15	0	80
TBD-1	037474 38	Beige	Steam Drum	--	ND	CELL FBG	5 20	0	75

Analysis Comments:

Samples analyzed according to the EPA/600/R-93 166 July 1993
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ACTN-ACTINOLITE	O-OTHER (SPECIFY)	
ANTH-ANTHOPHYLLITE		

ANALYZED BY-Karla Smith-Kasten

January 22, 2003
DATE ANALYZED

PLM & TEM
NVLAP Laboratory # 101732

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1515 Centre Circle Drive
Downers Grove, IL 60515-1770
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PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TBD-2	037474 39	Yellow	Steam Drum	-	ND	CELL FBG	3 5	0	92
TBD-3	037474 40	Yellow	Steam Drum	-	ND	CELL FBG	3 5	0	92
TBD-4	037474 41	Beige	Steam Drum	-	ND	CELL FBG	2 10	0	88
TBE-1	037474 42	Gray	Steam Drum	-	ND	CELL FBG	2 15	0	83
BE-2	037474 .43	Beige	Steam Drum	-	ND	CELL FBG	3 40	0	57
TBE-3	037474 44	Yellow White	Steam Drum	-	ND	CELL FBG	10 30	0	60

Analysis Comments:

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SYN-SYTHETIC
WOLL-WOLLASTONITE
H-HAIR
O-OTHER (SPECIFY)

CODES (MATRIX)
G-GYPSUM
C-CALCIUM CARBONATE
M-MICA
O-OTHER MATRIX

ANALYZED BY-Karla Smith-Kasten

January 22, 2003
DATE ANALYZED

PLM & TEM
NVLAP
NVLAP Laboratory # 101732

PCM
AIHA Laboratory # 101212

United
Analytical
Services, Inc.

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TBE-4	037474 45	Yellow Beige Silver	Steam Drum	--	ND	CELL FBG	5 80	0	15
TDD-1	037474 46	Silver Beige	Boiler Duct Insulation	--	ND	FBG	90	0	10
TDD-2	037474 47	Silver Gray	Boiler Duct Insulation	--	ND	FBG	90	0	10
TDD-3	037474 48	Silver Gray	Boiler Duct Insulation	--	ND	FBG	90	0	10
[redacted]D-4	037474 49	Silver Beige	Boiler Duct Insulation	--	ND	FBG	95	0	5
TBF-1	037474 50	Beige	Steam Drum Insulation	--	ND	FBG	50	0	50

Analysis Comments:

Samples analyzed according to the EPA/600/R-93 166 July 1993
entitled Method for the Determination of Asbestos in Bulk Building Materials
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CODES (ASBESTOS)
ND-NONE DETECTED
CHRY-CHRYSOTILE
AMOS-AMOSITE
CROC-CROCIDOLITE
TREM-TREMOLITE
ACTN-ACTINOLITE
ANTH-ANTHOPHYLLITE

CODES (OTHER FIBERS)
FBG-FIBER GLASS
CELL-CELLULOSE
SYN-SYTHETIC
WOLL-WOLLASTONITE
H-HAIR
O-OTHER (SPECIFY)

CODES (MATRIX)
G-GYPSUM
C-CALCIUM CARBONATE
M-MICA
O-OTHER MATRIX

ANALYZED BY-Karla Smith-Kasten

January 22, 2003
DATE ANALYZED

PLM & TEM
NVLAP
NVLAP Laboratory # 101732

PCM
AIHA Laboratory # 101212

United
Analytical
Services, Inc.

1515 Centre Circle Drive
Downers Grove, IL 60515-1770
630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TBF-2	037474 51	Beige	Steam Drum Insulation	--	ND	CELL FBG	10 5	0	85
TBF-3	037474 52	Beige	Steam Drum Insulation	--	ND	CELL FBG	10 5	0	85
TPD-1	037474 53	Yellow Beige	Canvas Pipe Wrap	--	ND	FBG	90	0	10
TPD-2	037474 54	Beige	Canvas Pipe Wrap	--	ND	FBG	90	0	10
TPD-3	037474 55	Beige Yellow	Canvas Pipe Wrap	--	ND	FBG	95	0	5
TPE-1	037474 56	Silver Yellow	Boiler Duct Insulation	--	ND	FBG	90	0	10

Analysis Comments:

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CODES (OTHER FIBERS)
FBG-FIBER GLASS
CELL-CELLULOSE
SYN-SYTHETIC
WOLL-WOLLASTONITE
H-HAIR
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CODES (MATRIX)
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REPORT DATE: January 23, 2003
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Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TDE-2	037474 57	Silver White	Boiler Duct Insulation	–	ND	FBG	90	0	10
TDE-3	037474 58	Silver Yellow White	Boiler Duct Insulation	–	ND	FBG	95	0	5
TJB-1	037474 59	Yellow Gray	2" Joint Insulation	–	ND	CELL FBG	5 45	0	50
TJB-2	037474 60	Beige	2" Joint Insulation	–	ND	CELL FBG	20 20	0	60
JB-3	037474 61	Brown Yellow	2" Joint Insulation	–	ND	CELL FBG	5 45	0	50
TJC-1	037474 62	Beige Tan	Canvas 6" Pipe Joint Insulation	–	ND	CELL FBG	10 75	0	15

Analysis Comments:

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ND-NONE DETECTED	FBG-FIBER GLASS	G-GYPSUM
CHRY-CHRYSOTILE	CELL-CELLULOSE	C-CALCIUM CARBONATE
AMOS-AMOSITE	SYN-SYTHETIC	M-MICA
CROC-CROCIDOLITE	WOLL-WOLLASTONITE	O-OTHER MATRIX
TREM-TREMOLITE	H-HAIR	
ACTN-ACTINOLITE	O-OTHER (SPECIFY)	
ANTH-ANTHOPHYLLITE		

ANALYZED BY-Karla Smith-Kasten

January 22, 2003
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PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJC-2	037474 63	Beige	Canvas 6" Pipe Joint Insulation	--	ND	FBG	60	0	40
TJC-3	037474 64	Orange Beige	Canvas 6" Pipe Joint Insulation	--	ND	FBG	90	0	10
TBG-1	037474 65	Beige	Steam Drum Insulation	--	ND	FBG	70	0	30
TBG-2	037474 66	Beige	Steam Drum Insulation	--	ND	FBG	10	0	90
TBG-3	037474 67	Beige	Steam Drum Insulation	--	ND	CELL FBG	10 40	0	50
MMC-1	037474 68	Orange	Fire Brick	--	ND	--	ND	0	100

Analysis Comments:

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M-MICA
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ANALYZED BY: Karla Smith-Kasten

January 22, 2003
DATE ANALYZED

PLM & TEM
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630-691-8271 Fax: 630-691-1819

PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
MMC-2	037474 69	Orange	Fire Brick	--	ND	--	ND	0	100
MMC-3	037474 70	Orange	Fire Brick	--	ND	--	ND	0	100
MMD-1	037474 71	Beige	Fire Brick	--	ND	--	ND	0	100
MMD-2	037474 72	Beige	Fire Brick	--	ND	--	ND	0	100
MD-3	037474 73	Beige	Fire Brick	--	ND	--	ND	0	100
TJD-1	037474 74	Gray	Joint Insulation	--	ND	FBG	70	0	30

Analysis Comments:

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WOLL-WOLLASTONITE
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O-OTHER MATRIX

ANALYZED BY: Karla Smith-Kasten

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PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
ATTENTION: Aaron Villages
FAX: NA

REPORT DATE: January 23, 2003
DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJD-2	037474 75	Gray	Joint Insulation	--	ND	CELL FBG	10 20	0	70
TJD-3	037474 76	Gray	Joint Insulation	--	ND	CELL FBG	5 25	0	70
TPE-1	037474 77	Orange Beige	Pipe Wrap	--	ND	FBG	95	0	5
TPE-2	037474 78	Silver Beige	Pipe Wrap	--	ND	CELL FBG	50 30	0	20
[redacted]PE-3	037474 79	Silver Beige	Pipe Wrap	--	ND	FBG	95	0	5
TJE-1	037474 80	Beige	Pipe Joint Canvas	--	ND	FBG	35	0	65

Analysis Comments:

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PLM LABORATORY REPORT

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CLIENT: United Analytical Services, Inc
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DATE RECEIVED: January 20, 2003
UAS SAM#: 037474
JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJE-2	037474 81	Beige	Pipe Joint Canvas	–	ND	FBG	45	0	55
TJE-3	037474 82	Beige	Pipe Joint Canvas	–	ND	FBG	2	0	98
TPF-1	037474 83	Silver Tan	Pipe Wrap	–	ND	CELL	90	0	10
TPF-2	037474 84	Silver Yellow Tan	Pipe Wrap	--	ND	CELL FBG	50 30	0	20
F-3	037474 85	Silver Yellow Tan	Pipe Wrap	–	ND	CELL FBG	35 40	0	25
TJF-1	037474 86	Beige	Pipe Joint Wrap	--	ND	FBG	95	0	5

Analysis Comments:

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ANALYZED BY-Karla Smith-Kasten

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PLM LABORATORY REPORT

METHOD: EPA/600/R-93/116 July 1993
PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
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REPORT DATE: January 23, 2003
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Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJF-2	037474 87	Beige	Pipe Joint Wrap	--	ND	FBG	95	O	5
TJF-3	037474 88	Beige	Pipe Joint Wrap	--	ND	FBG	95	O	5
TTA-1	037474 89	White	Tank Insulation	CHRY AMOS	15 35	--	ND	O	50
TTB-1	037474 92	Gray	Tank Insulation	CHRY AMOS	25 15	--	ND	O	60
TPG-1	037474 95	Orange	Pipe Run	--	ND	FBG	90	O	10
TPG-2	037474 96	Orange	Pipe Run	--	ND	FBG	90	O	10

Analysis Comments:

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AMOS-AMOSITE	SYN-SYTHETIC	M-MICA
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TPG-3	037474 97	Orange	Pipe Run	--	ND	FBG	90	0	10
TPM-1	037474 98	Orange	Pipe Run	--	ND	FBG	90	0	10
TPM-2	037474 99	Orange	Pipe Run	--	ND	FBG	90	0	10
TPM-3	037474 100	Orange	Pipe Run	--	ND	FBG	90	0	10
TPI-1	037474 101	White	Pipe Run	AMOS	30	CELL	5	0	65
TJG-1	037474 104	Beige	Pipe Joint	CHRY	15	CELL FBG	10 25	0	50

Analysis Comments:

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entitled Method for the Determination of Asbestos in Bulk Building Materials
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PLM w/ Dispersion Staining
CLIENT: United Analytical Services, Inc
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JOB LOCATION: Exelon
Building #1, Great Lakes, Illinois

CLIENT SAMPLE #	LAB SAMPLE #	COLOR	DESCRIPTION/ LOCATION	ASBESTOS TYPE	%	OTHER FIBERS	%	MATRIX	%
TJH-1	037474 107	White	Pipe Joint	CHRY	10	CELL FBG	10 25	0	55
TPJ-1	037474 110	White	Pipe Insulation	CHRY	30	CELL	10	0	60
TJI-1	037474 113	White Gray	Pipe Joint	CHRY	15	CELL FBG	10 20	0	55

Analysis Comments:

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NVLAP Laboratory # 101732

PCM
AIHA Laboratory # 101212

APPENDIX B
ASBESTOS BUILDING INSPECTOR LICENSE AND CERTIFICATION

State of Illinois A 131352

Department of Public Health

LICENSE, PERMIT, CERTIFICATION, REGISTRATION

The person, firm or corporation whose name appears on this certificate has complied with the provisions of the Illinois Statutes and/or rules and regulations and is hereby authorized to engage in the activity as indicated below.

JOHN R. LUMPKIN, M.D.
DIRECTOR

Issued under the authority of
The State of Illinois
Department of Public Health

EXPIRATION DATE	CATEGORY	I.D. NUMBER
05/15/2003	5319	100-06570

AARON VILLEGAS

PROJECT MANAGER
INSPECTOR AIR SAMPLING PROFESSIONAL

BUSINESS ADDRESS
ASBESTOS PROFESSIONAL LICENSE
ALTERING THIS CERTIFICATE MAY RESULT IN LEGAL ACTION
AARON VILLEGAS
3542 W 72ND STREET
CHICAGO IL 60629
THIS LICENSE IS NOT VALID IF YOUR IDPH
COURSE CERTIFICATE IS NOT CURRENT

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State of Illinois A 131352
Department of Public Health
LICENSE, PERMIT, CERTIFICATION, REGISTRATION
ASBESTOS PROFESSIONAL LICENSE

EXPIRATION DATE	CATEGORY	I.D. NUMBER
05/15/2003	5319	100-06570

AARON VILLEGAS

PROJECT MANAGER
INSPECTOR AIR SAMPLING PROFESSIONAL

THE PERSON, FIRM OR CORPORATION WHOSE NAME APPEARS ON THIS CERTIFICATE HAS COMPLIED WITH THE PROVISIONS OF THE ILLINOIS STATUTES AND/OR RULES AND REGULATIONS AND IS HEREBY AUTHORIZED TO ENGAGE IN THE ACTIVITY INDICATED ON THE FACE OF THIS CARD.

ISSUED UNDER THE AUTHORITY OF
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC HEALTH

AMERISAFE INC.

ASBESTOS BUILDING INSPECTOR REFRESHER COURSE CERTIFICATE

IDPH & IDEM APPROVED

THIS CERTIFIES THAT

AARON VILLEGAS
354-70-7030

Has successfully completed the IL & IN Approved Asbestos Building Inspector Refresher Training Course and passed the Examination for purposes of accreditation under section 206 of Title II of the Toxic Substances Control Act (TSCA). Conducted by Amerisafe Training Services, 2050 N. 15th Avenue, Melrose Park, IL. 60160. 1-708-681-1250.

COURSE DATE: MARCH 11, 2002

EXPIRATION: MARCH 11, 2003

CERTIFICATE NUMBER: ATS2002-0292

DIRECTOR OF TRAINING

State of Illinois A 133978

Department of Public Health

LICENSE, PERMIT, CERTIFICATION, REGISTRATION

ASBESTOS PROFESSIONAL LICENSE

EXPIRATION DATE	CATEGORY	I.D. NUMBER
05/15/2003	5319	100-09199

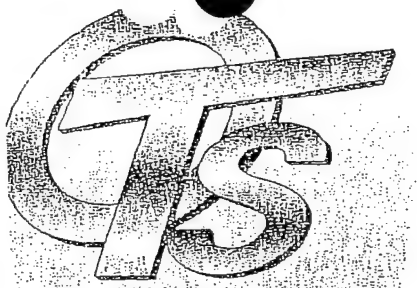
STEFAN CLOUSE

INSPECTOR

THE PERSON, FIRM OR CORPORATION WHOSE NAME APPEARS ON THIS CERTIFICATE HAS COMPLIED WITH THE PROVISIONS OF THE ILLINOIS STATUTES AND/OR RULES AND REGULATIONS AND IS HEREBY AUTHORIZED TO ENGAGE IN THE ACTIVITY INDICATED ON THE FACE OF THIS CARD.

ISSUED UNDER THE AUTHORITY OF
STATE OF ILLINOIS
DEPARTMENT OF PUBLIC HEALTH

SIGNATURE OF LICENSEE



Occupational Training & Supply, Inc.

12601 S. Springfield • Alsip, IL 60803 • 708 / 385-1325

Stefan Clouse

392-78-6743

has successfully completed the 24 hour Asbestos Building Inspector course and has passed the competency exam with a minimum score of 70%. This course is accredited by the Illinois Department of Public Health and Indiana Department Environmental Management for purposes of accreditation in accordance with EPA 40 CFR 763, Asbestos Hazard Emergency Response Act (AHERA) and TSCA Title II.

Asbestos Building Inspector

Course Date: October 15-17, 2002
Expiration Date: October 17, 2003

Exam Date: October 17, 2002
Certificate: ABI0210152645

2002

Kathy Nicholson, Director

APPENDIX C
LABORATORY ACCREDITATION

United States Department of Commerce
National Institute of Standards and Technology

NVLAP®

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Certificate of Accreditation

DEPARTMENT OF COMMERCE
UNITED STATES OF AMERICA

UNITED ANALYTICAL SERVICES, INC.
DOWNERS GROVE, IL

is recognized under the National Voluntary Laboratory Accreditation Program for satisfactory compliance with criteria established in Title 15, Part 285 Code of Federal Regulations. These criteria encompass the requirements of ISO/IEC Guide 25 and the relevant requirements of ISO 9002 (ANSI/ASQC Q92-1987) as suppliers of calibration or test results. Accreditation is awarded for specific services, listed on the Scope of Accreditation for:

BULK ASBESTOS FIBER ANALYSIS

June 30, 2003

Effective through

David F. Alderman

For the National Institute of Standards and Technology
NVLAP Lab Code: 101732-0

NVLAP-01C (11-95)

National Institute of Standards and Technology

NVLAP®

National Voluntary Laboratory Accreditation Program

ISO/IEC GUIDE 25:1990
ISO 9002:1987

Scope of Accreditation

BULK ASBESTOS FIBER ANALYSIS

NVLAP LAB CODE 101732-0

UNITED ANALYTICAL SERVICES, INC.
1515 Centre Circle Drive
Downers Grove, IL 60515-1024
Dr. Kevin Aikman
Phone: 630-691-8271 Fax: 630-691-1819
E-Mail: uasinc@uas1.com
URL: http://www.uas1.com

NVLAP Code	*Designation*
18/A01	EPA-600/M4-82-020: Interim Method for the Determination of Asbestos in Bulk Insulation Samples

June 30, 2003

Effective through

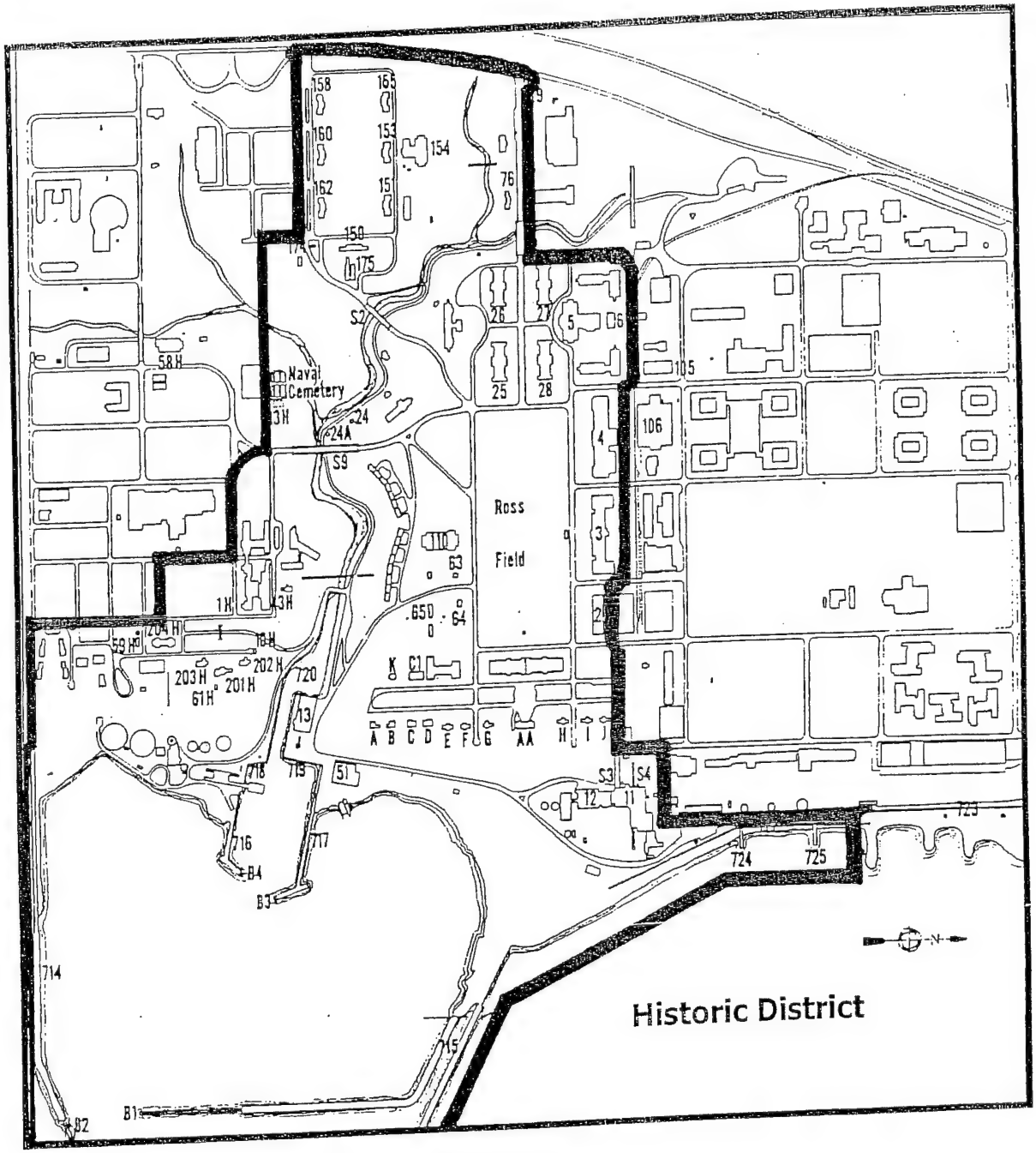
David F. Alderman

For the National Institute of Standards and Technology

Appendix H

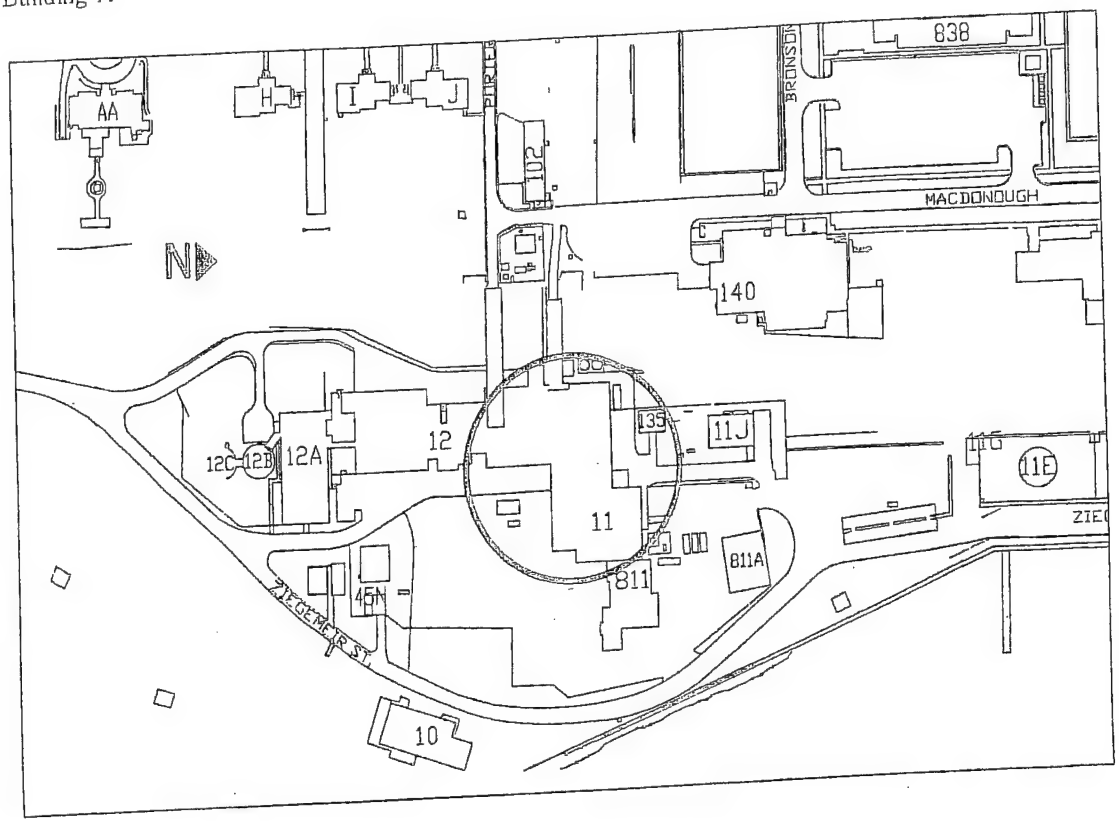
Central Utility Plant Cultural Resource Investigations for the Mainside Area of the Naval Training Center

FIGURE B.3 GREAT LAKES HISTORIC DISTRICT MAP



ILLINOIS ARCHITECTURAL AND
HISTORICAL SURVEY
Map Sheet

Map of Building 11



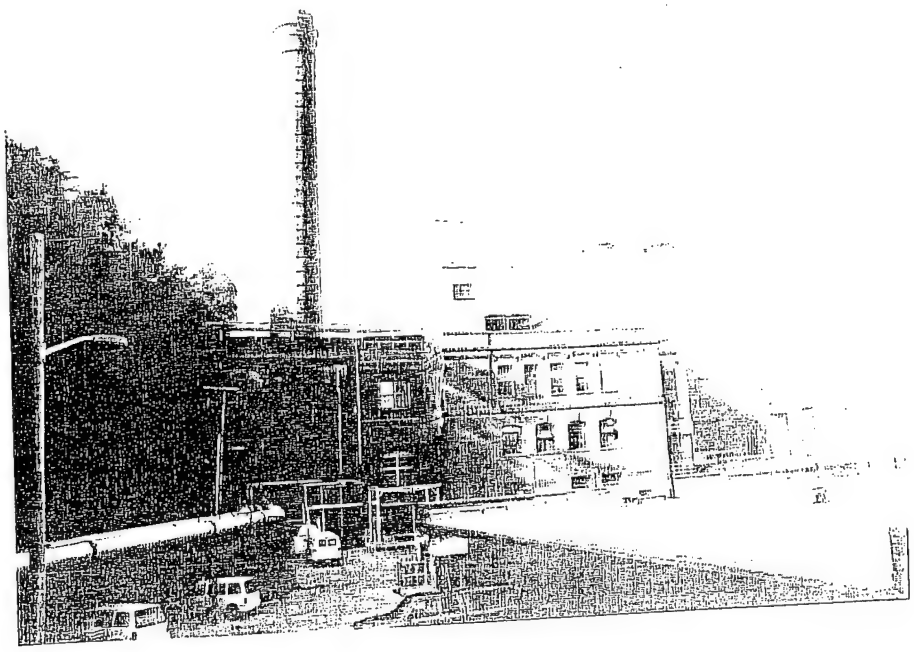


TABLE B.1 CONTRIBUTING FACILITIES OF MAJOR SIGNIFICANCE WITHIN THE GREAT LAKES HISTORIC DISTRICT

Number	Date	Original Use	Current Use
1	1906	Administration	NTC Headquarters
2	1906	Storehouse	Administration/Classrooms
3	1906	Instruction	SSC Headquarters, Library
4	1906	Drill Hall	Gymnasium/Indoor Playing Courts
5	1906	Mess Hall and Galley	NTC/Navy Exchange Maintenance
6	1906	Brig	Security
11	1906	Power House	Main Power Plant
13	1906	Boathouse	Boathouse
25	1906	Dormitory	No in Use
26	1906	Dormitory	BEQ, CPO EM Staff
27	1906	Dormitory	BEQ, E5-E6 EM Staff
28	1906	Dormitory	Not in Use
63	1915	Radio Station Building	Family Quarters
64	1918	Radio Operator's Quarters	Family Quarters
76	1916	American Red Cross	Red Cross Administration
150	1906	Receiving Building	Navy Band Office/Practice Facility
151	1907	Dormitory	Not in Use
153	1907	Dormitory	MARS/Pre-School (Private)
154	1906	Galley and Laundry	MWR Maintenance Facility
155	1907	Dormitory	Travel Service Group
158	1907	Dormitory	Navy Exhibit/Museum
160	1907	Dormitory	NTC MWR Administration
162	1907	Dormitory	Navy Relief Thrift Store
174	1906	Guardhouse	MWR Bowling Repair Shop
10H	1925	Garage	Garage
1H	1909	Hospital	Dental Research/CCPO
201H	1909	Officer's Quarters	Family Quarters
202H	1909	Officer's Quarters	Family Quarters
203H	1909	Officer's Quarters	Family Quarters
204H	1927	Apartment House for Four Officers	Family Quarters
3H	1919	Naval Cemetery	Naval Cemetery
43H	1909	Laundry	Dental Research
A	1908	Officer's Quarters	Family Quarters
AA	1911	Commandant's Quarters	Commandant's Quarters
B	1908	Officer's Quarters	Family Quarters
C	1908	Officer's Quarters	Family Quarters

ILLINOIS ARCHITECTURAL AND
HISTORICAL SURVEY
Great Lakes Naval Training Center
Historic Resources Survey

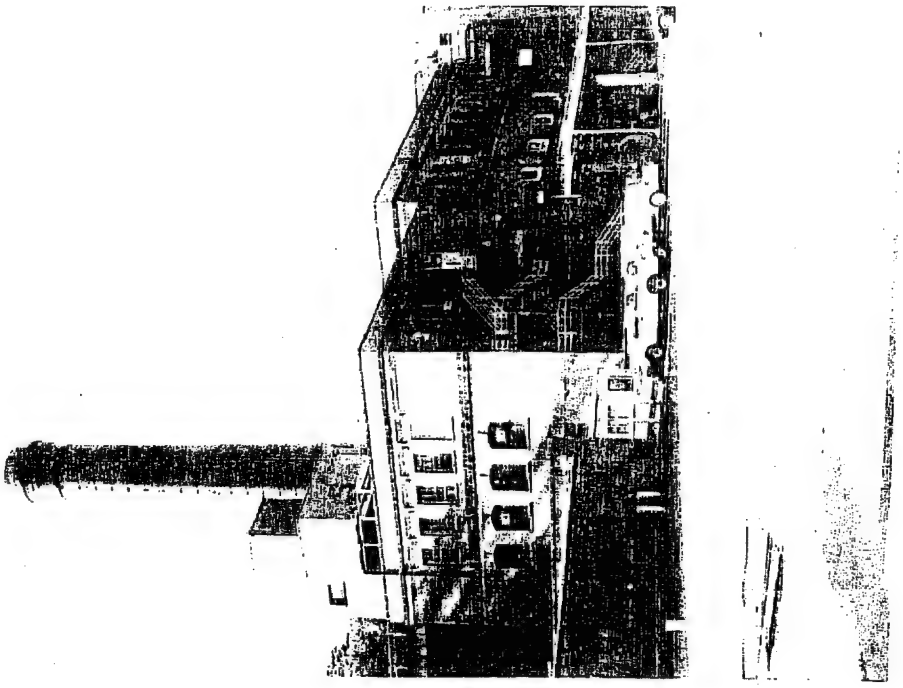
ADDRESS: 2530 Ziegemeier St.
Great Lakes Naval Training Center

NAME
Common Building 11, Main Power Plant
Historical Building 11, Power House

PHOTO
Roll No. 11 Exterior X
Frame Number 22-23 Interior

CONDITION
Excellent
Good X
Deteriorated

UTM Quad: Waukegan, Illinois
Zone 16 Easting 431440 Northing 4684706



DESCRIPTION (Style or type, shape or plan, no. of stories, roof shape, decorative work, etc.)
See continuation sheet.
Subsidiary Buildings
visible.

MAJOR PHYSICAL CHANGES FROM ORIGINAL CONSTRUCTION
This structure has undergone substantial modifications, including the alteration of some openings, the addition of an upper floor, and the construction of several support buildings to the east and north. These additions nearly double the size of the original structure, but the original structure is still clearly visible.

HISTORY
Construction date 1906 Builder/Architect Jarvis Hunt
Associated events, people, and dates

The establishment of a Naval training center near Chicago was authorized by President Roosevelt in 1904. The base was dedicated and opened in 1911 as the Great Lakes Naval Training Station. The original complex included 39 permanent buildings, and could accommodate 1,500 men. The base's buildings were designed by Jarvis Hunt, an eminent New York architect best known as the nephew of renowned late Victorian architect Richard Morris Hunt. (continued)

NATIONAL REGISTER EVALUATION
A. Individually Yes No X
B. As part of a potential historic district Yes X No
C. Explain Rationale - specify criteria A,B,C,D, or any combination of any

For nearly a century, the Great Lakes Naval Training Center has served as the Navy's largest training facility. The original buildings of the base and other related historic properties are the heart of Great Lakes, and form a coherent historic district that is National Register eligible under Criterion C. These buildings were designed by a well-known American architect, retain a high level of integrity, and exemplify the formally organized community planning that was prevalent at the turn of the century.

Sources/Comments
Great Lakes NTC, Public Works Office, Engineering and Architectural Drawing Files; National Archives; Navy Department Libraries; Illinois State Historical Libraries; Great Lakes NTC Library; Chicago Historical Society; Collection of W.R. Hasbrouck.

SURVEYOR

H. Hunderman, D. Slaton
Hasbrouck Hunderman Architects
Chicago, IL.

Revised by: R. Hampton, M. Crowe
Hardlines Design Company
Columbus, OH

DATE

January 1984
Revised: October 2000

ILLINOIS ARCHITECTURAL AND
HISTORICAL SURVEY
Continuation Sheet

..AME
Common Building 11, Main Power Plant

Historical Building 11, Power House

ADDRESS: 2530 Ziegemeier St.
Great Lakes Naval Training Center

****

Description

Building 11 is a three-story structure with a partial fourth story and a large brick chimney at the southwest corner. The chimney is encircled with steel straps, and is topped with a band of terra cotta. It is constructed of red brick with terra cotta trim. Dark brown terra cotta is used for belt courses and coping, while red terra cotta is used for keystones above windows. The building is part of the mechanical facilities complex, and has been substantially altered. New buildings have been constructed to the east and north of the original structure. The first addition is brick with multi-light casement windows. It also has large metal smokestacks. The second addition is clad in vertical metal siding, and has no windows. While these additions are larger than the original structure, the original structure is still plainly visible.

History

The base was located on a series of bluffs divided by a ravine carved into the site by Pettibone Creek. At the point where the creek emptied into Lake Michigan, a harbor was established for the base. North of the ravine sat officers' houses and the base's main parade ground. Buildings on the north, east, and west surrounded this parade ground, while the south side was left open to the Pettibone Creek ravine. Dormitories, mess halls, drill halls, classrooms and the administration building were grouped around the parade ground. Receiving facilities for new recruits were positioned southeast of the main parade ground. The U.S. Naval Hospital was located south of the main parade ground and the Pettibone Creek ravine.

The layout of the base was the result of collaboration between Jarvis Hunt's office and U.S. Navy engineer George McKay. While the base as constructed accommodated 1,500 men, the original master plan for the base anticipated additional construction that would expand the base to accommodate 3,000 men.

Great Lakes expanded to train a large number of U.S. Navy personnel during World War I. The facility was down scaled in the 1920s and 1930s, but expanded rapidly again during World War II. Barracks, drill halls, and other structures were built to keep the base's training capacity high. Many of these structures were of World War II temporary wood frame mobilization construction. With the acceleration of the Cold War, an expansion of all branches of the armed forces occurred. A high demand for new recruits assured that the population of Great Lakes would continue to grow. Therefore, a building campaign was begun to replace the ramshackle World War II structures, and to build on undeveloped portions of the base. Isolated areas of construction have occurred across the base in the 1980s and 1990s.

Building 11 is one of the original Great Lakes Naval Training Station buildings designed by Hunt. It is one of the two original Lakeshore Facilities designed by Hunt with the mechanical systems designed by Navy engineers (Buildings 11 & 13). It was built as the power plant, and is a contributing element to the historic district despite its heavy additions.

Appendix I

Federal Emergency Management Agency Published Flood Insurance Rate Maps and Floodway Maps

NATIONAL FLOOD INSURANCE PROGRAM

FIRM

FLOOD INSURANCE RATE MAP

LAKE COUNTY,
ILLINOIS
AND INCORPORATED AREAS

PANEL 180 OF 295

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE COUNTY	170357	0180	F
NORTH CHICAGO, CITY OF	170384	0180	F
WAUKEGAN, CITY OF	170397	0180	F

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
17097C0180 F

EFFECTIVE DATE:
SEPTEMBER 3, 1997

Federal Emergency Management Agency

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD), and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Corporate limits shown on this map are based on the best data available. The user should contact appropriate community officials to verify the corporate limit delineations shown on this map.

For community map revision history prior to countywide mapping, see section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

DIGITAL DATA AVAILABILITY: Digital files containing the thematic floodplain information shown on these maps are published by the Federal Emergency Management Agency in DLG-3 Optional format on CD-ROM. Requests for data should include the full name of the community or county and the Flood Insurance Rate Map panel numbers covered by the request. Contact the Federal Emergency Management Agency, Map Service Center, 6730 Santa Barbara Court, Baltimore, Maryland 21227-5832. Telephone 1-800-358-9616.

NOTE: The coordinate system used for the production of this Flood Insurance Rate Map (FIRM) is Universal Transverse Mercator (UTM), North American Datum of 1927 (NAD27), Clarke 1866 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the Universal Transverse Mercator projection, NAD27. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of the information shown on the FIRM.

ATTENTION: Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

BASE MAP SOURCE: Planimetric base map information files were provided by Lake County, Illinois, Department of Management Services. These files were compiled at a scale of 1" = 200' from orthophotographs dated 1984 to 1986.

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100–YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100–year flood by Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500–year flood; areas of 100–year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100–year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500–year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS*

Identified 1983

Identified 1990 or Later

Otherwise Protected Areas Identified 1991 or Later

(3)

*Coastal barrier areas are normally located within or adjacent to Special Flood

1983 1990 or Later — Identified 1991 or Later

*Coastal barrier areas are normaliy located within or adjacent to Special Flood Hazard Areas.

———————	Floodplain Boundary
— — — — — — —	Floodway Boundary
- ——— ——— -	Zone D Boundary
▓▓▓▓▓▓▓▓ ←	Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
~~ 513 ~~~~	Base Flood Elevation Line; Elevation in Feet**
(A)——————(A)	Cross Section Line
(EL 987)	Base Flood Elevation in Feet Where Uniform Within Zone**
RM7 x	Elevation Reference Mark
● M1.5	River Mile

**Referenced to the National Geodetic Vertical Datum of 1929

MAP REPOSITORY

Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE FLOOD INSURANCE RATE MAP

SEPTEMBER 3, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

(4)

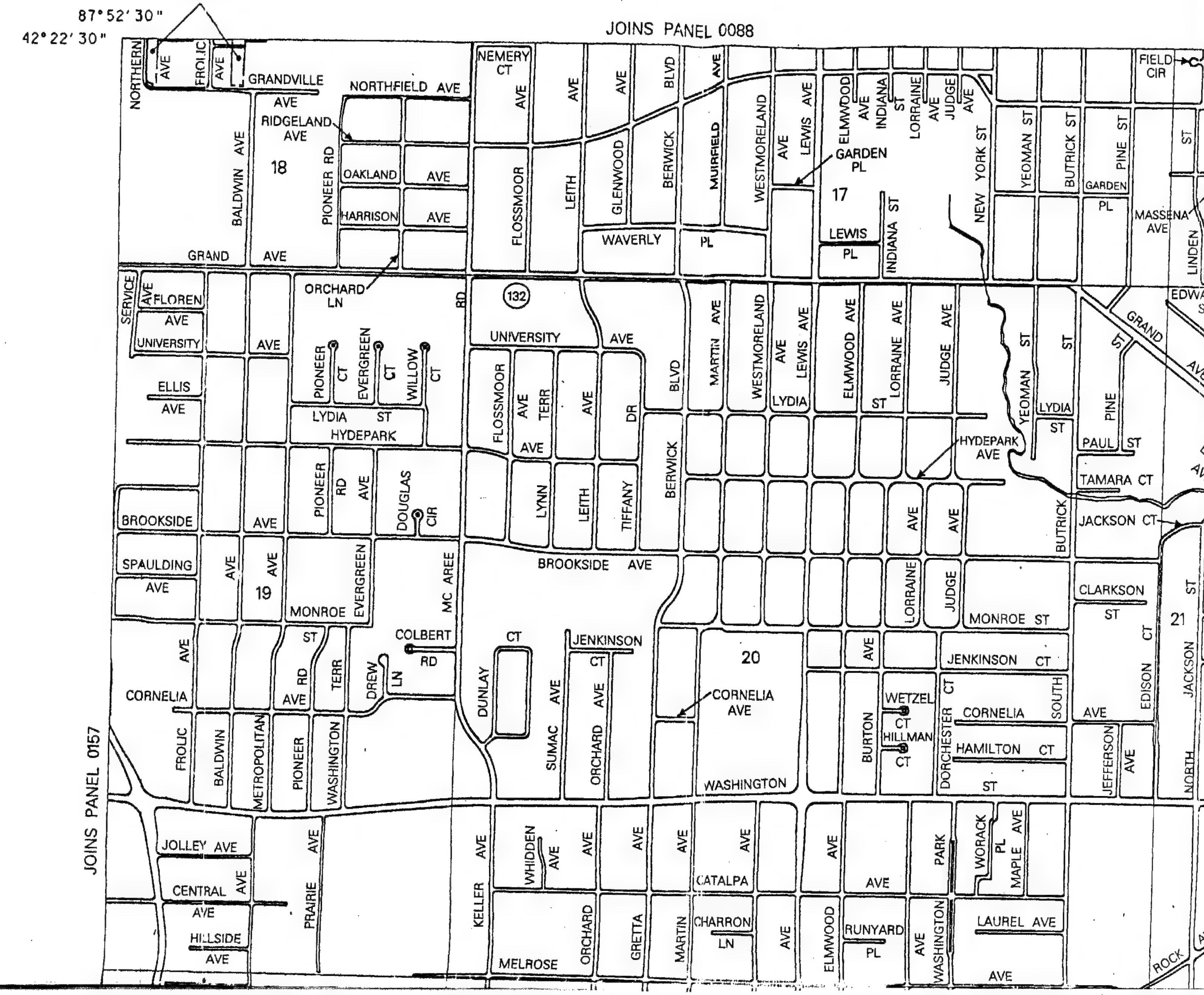
Refer to the FLOOD INSURANCE RATE MAP effective date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

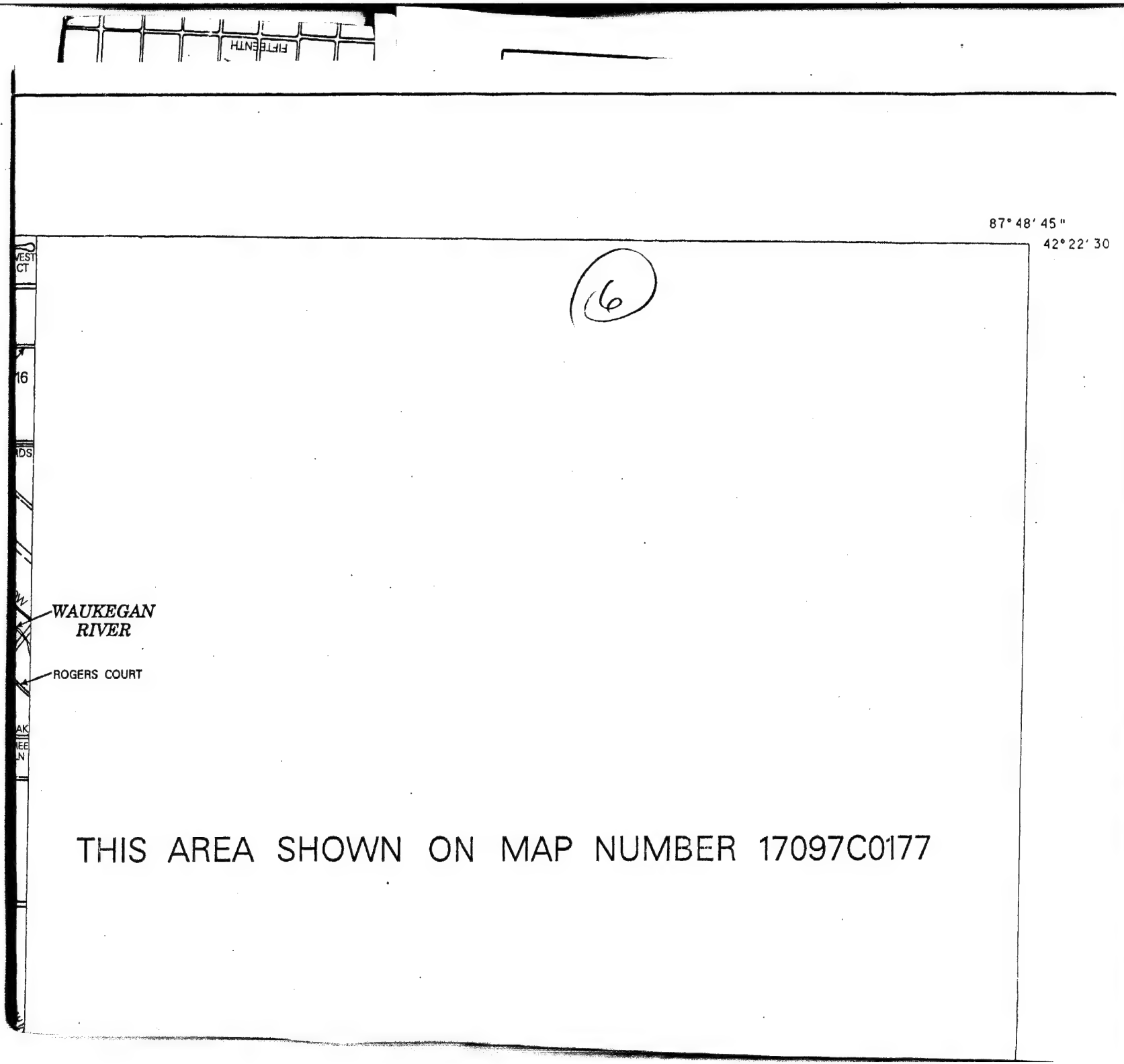
To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

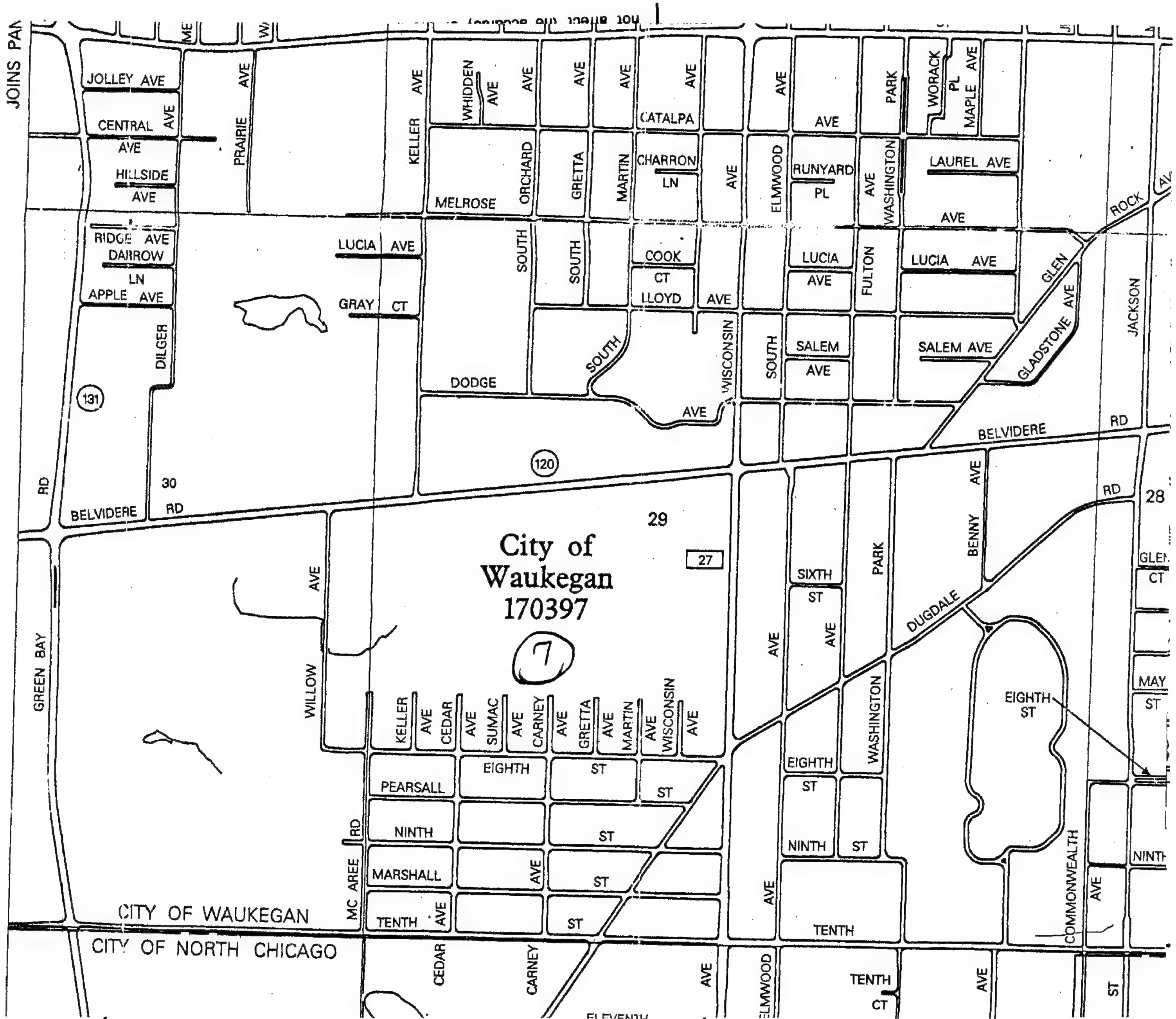
APPROXIMATE SCALE

1000 0 1000 FEET

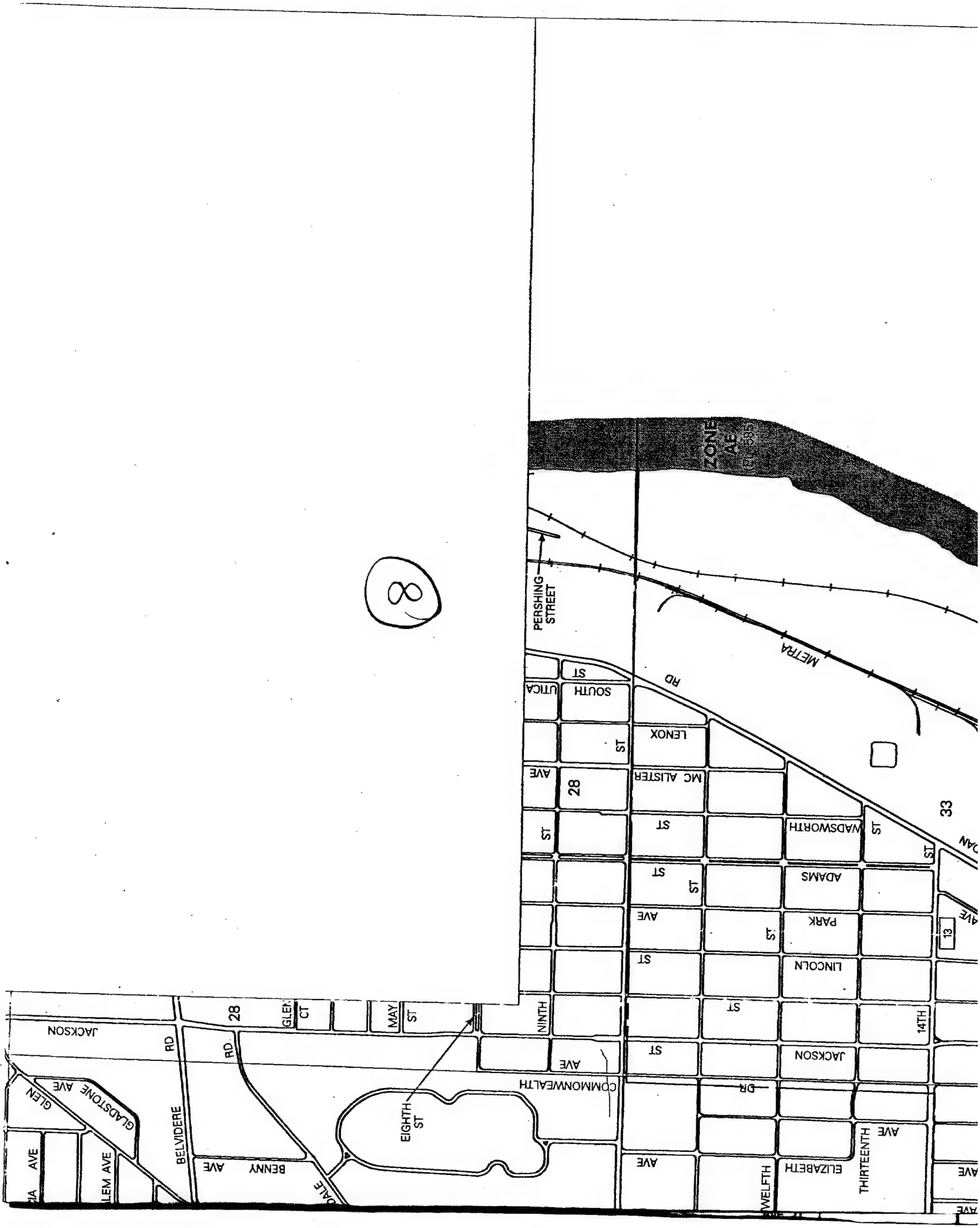
Lake County
Unincorporated Areas
170357

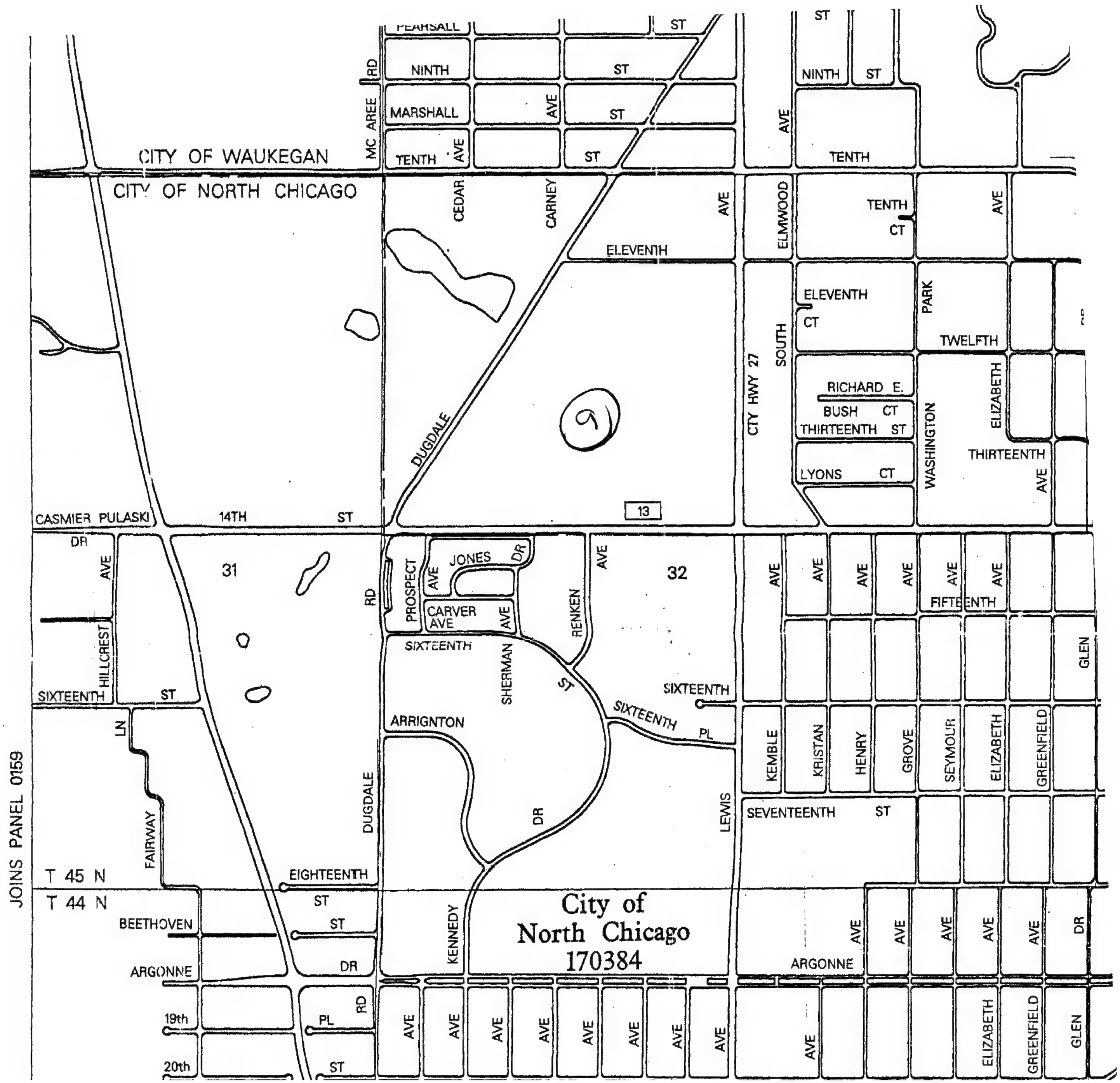


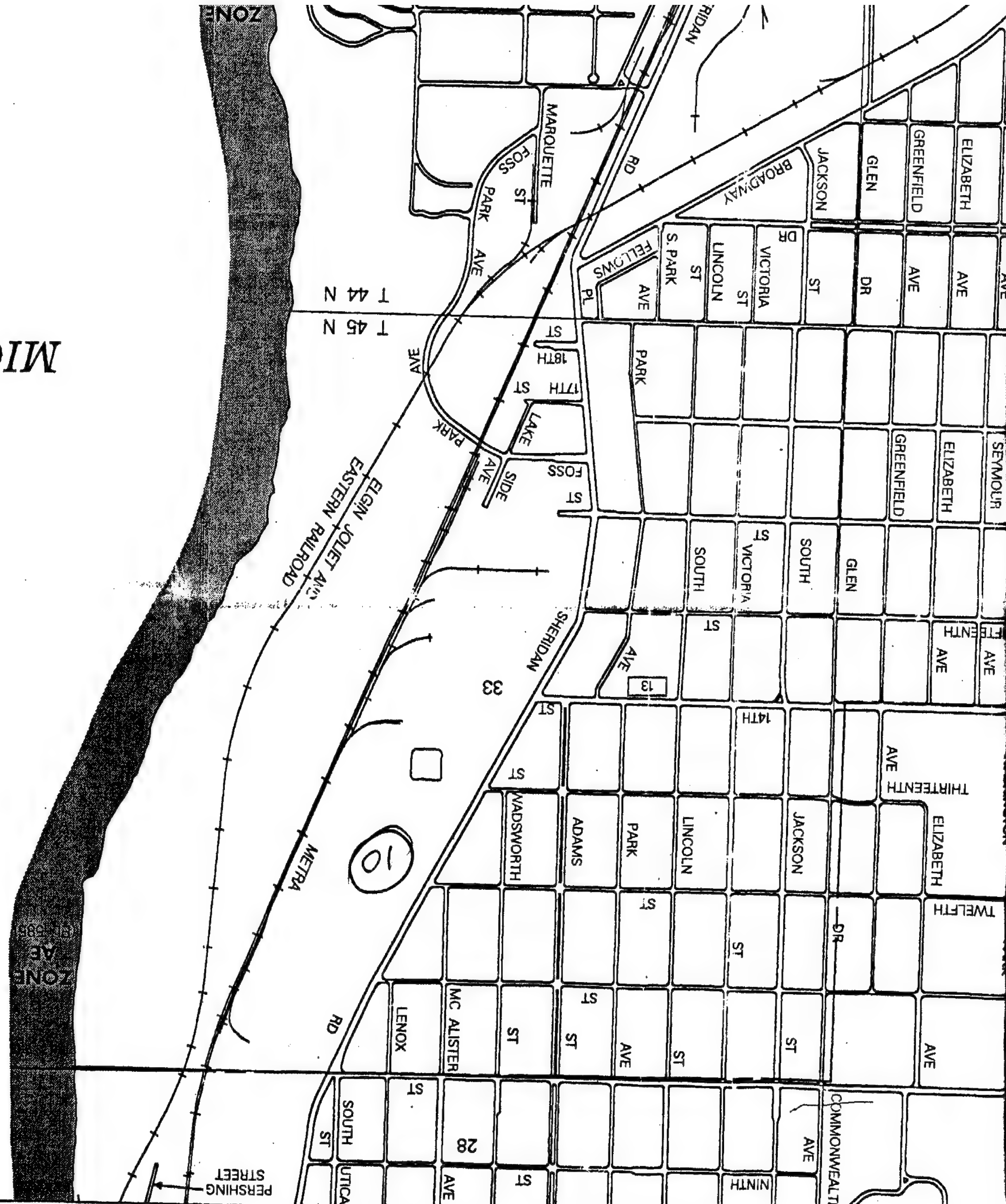

87° 48' 45"
42° 22' 30
16
WAUKEGAN
RIVER
ROGERS COURT
THIS AREA SHOWN ON MAP NUMBER 17097C0177



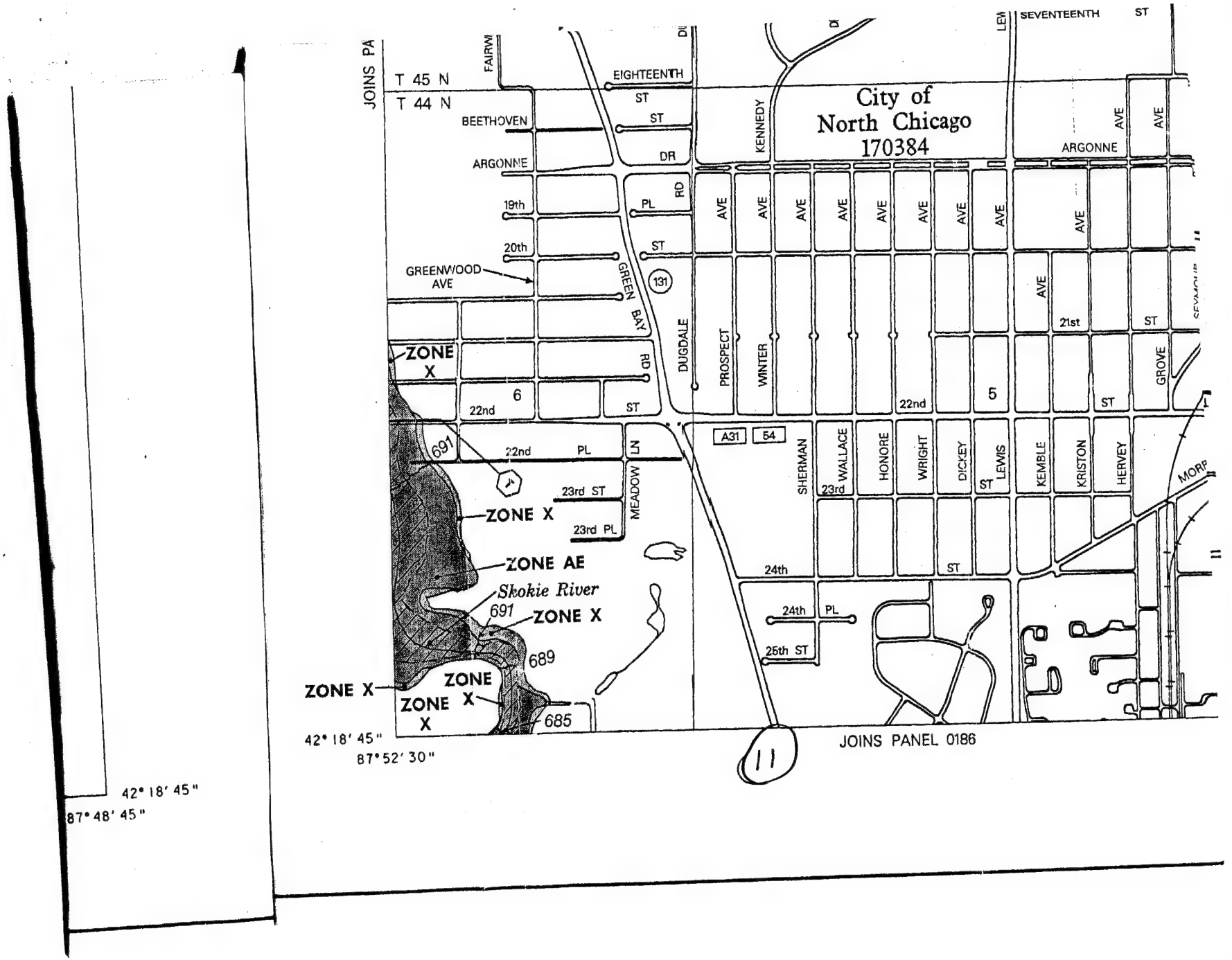
City of
Waukegan
170397
7
29
27
28
30
120
131
CITY OF WAUKEGAN
CITY OF NORTH CHICAGO
JOINS PAN
BELVIDERE RD
GREEN BAY RD
JACKSON
ROCK
GLEN
GLADSTONE AVE
DUGDALE
BENNY AVE
PARK AVE
WASHINGTON
SIXTH ST
EIGHTH ST
NINTH ST
TENTH
TENTH CT
COMMONWEALTH
MAY ST
GLEN CT
ELMWOOD AVE
WISCONSIN AVE
SOUTH AVE
SALEM AVE
LUCIA AVE
FULTON
LAUREL AVE
MAPLE AVE
WORACK PL
RUNYARD PL
CATALPA AVE
CHARRON LN
COOK CT
LLOYD AVE
MARTIN AVE
GRETTA AVE
ORCHARD AVE
WHIDDEN AVE
MELROSE AVE
KELLER AVE
DODGE
GRAY CT
PRAIRIE AVE
JOLLEY AVE
CENTRAL AVE
HILLSIDE AVE
RIDGE AVE
DARROW LN
APPLE AVE
DILGER
WILLOW AVE
MC AREE RD
CEDAR AVE
SUMAC AVE
CARNEY AVE
PEARSALL
MARSHALL AVE

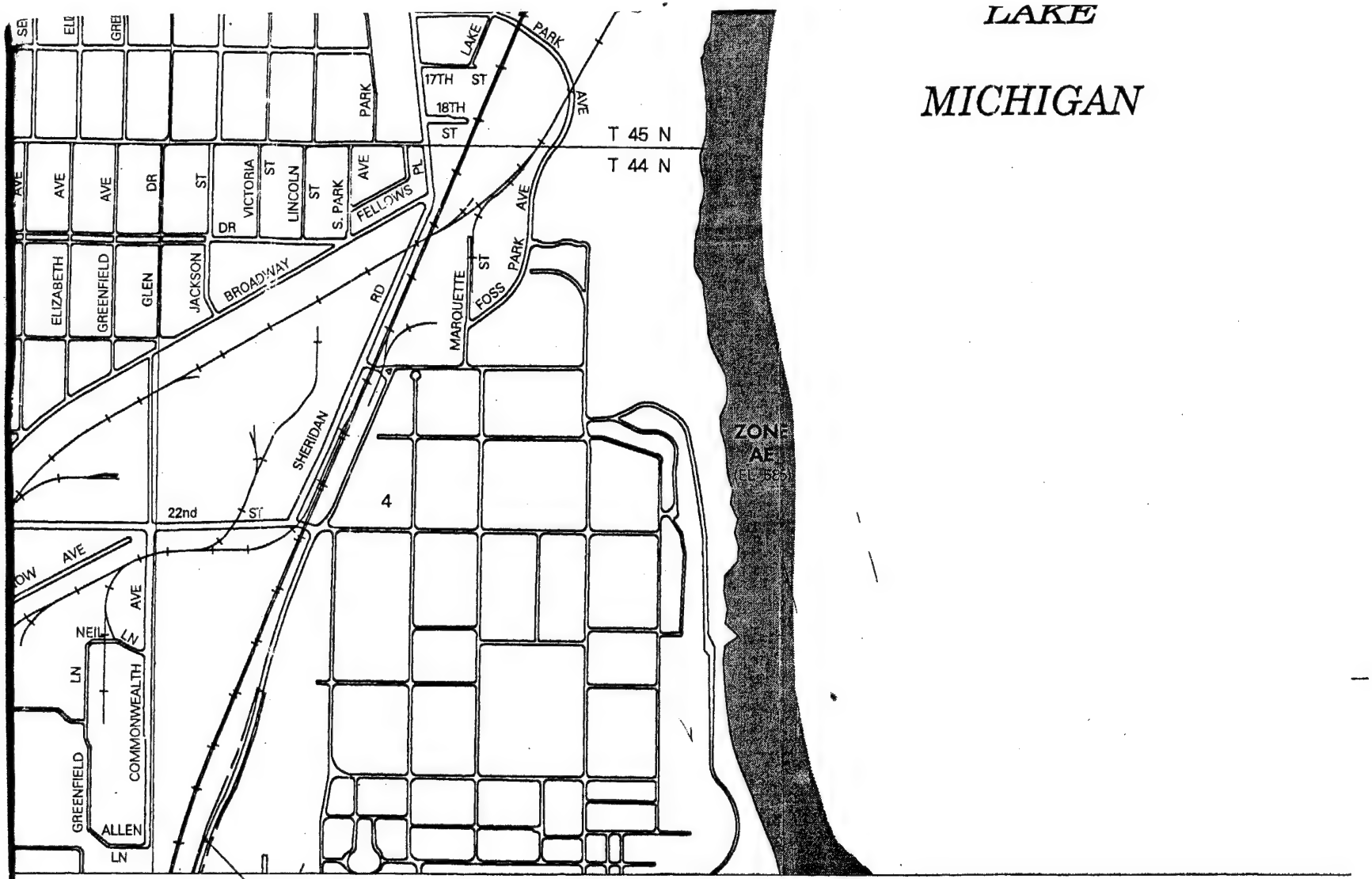

ZONE AE
PERSHING STREET
METRA
RD
SOUTH
UTICA
ST
LENOX
MC ALISTER
AVE
28
WADSWORTH
33
ADAMS
PARK
13
LINCOLN
JACKSON
14TH
COMMONWEALTH
DR
THIRTEENTH
ELIZABETH
NINTH
MAY
GLEN CT
EIGHTH ST
BELVIDERE
BENNY
GLADSTONE AVE
GLEN


CITY OF WAUKEGAN
CITY OF NORTH CHICAGO
City of
North Chicago
170384
JOINS PANEL 0159
T 45 N
T 44 N
CASMIER PULASKI DR
14TH ST
DUGDALE RD
MC AREE RD
SIXTEENTH ST
EIGHTEENTH ST
ARGONNE DR
CTY HWY 27
LEWIS AVE
SHERMAN AVE
KENNEDY DR
ARRIGNTON
SEVENTEENTH ST
FIFTEENTH
ELEVENTH
TENTH
NINTH
MARSHALL
CEDAR
CARNEY
ELMWOOD
SOUTH
PARK
TWELFTH
RICHARD E. BUSH CT
THIRTEENTH ST
LYONS CT
WASHINGTON
ELIZABETH
THIRTEENTH AVE
KEMBLE
KRISTAN
HENRY
GROVE
SEYMOUR
GREENFIELD
GLEN
JONES DR
CARVER AVE
PROSPECT
RENKEN
SIXTEENTH PL
HILLCREST
FAIRWAY LN
BEETHOVEN
19th PL
20th ST
31
32
13



Refer to Repository Listing on Map Index


City of
North Chicago
170384
T 45 N
T 44 N
JOINS PA
EIGHTEENTH ST
SEVENTEENTH ST
BEETHOVEN
ARGONNE
KENNEDY
FAIRVIEW
19th
20th
GREENWOOD AVE
GREEN BAY RD
131
PL
DR
ST
AVE
DUGDALE
PROSPECT
WINTER
SHERMAN
WALLACE
HONORE
WRIGHT
DICKEY
LEWIS
KEMBLE
KRISTON
HERVEY
GROVE
21st
22nd
23rd
24th
25th ST
22nd PL
23rd ST
23rd PL
24th PL
MEADOW LN
A31
54
6
5
691
689
685
ZONE X
ZONE AE
Skokie River
42° 18' 45"
87° 52' 30"
42° 18' 45"
87° 48' 45"
JOINS PANEL 0186


LAKE
MICHIGAN
T 45 N
T 44 N
17TH ST
18TH ST
LAKE
PARK AVE
PARK
VICTORIA ST
LINCOLN ST
S. PARK AVE
FELLOWS PL
DR
ELIZABETH
GREENFIELD
GLEN
JACKSON
BROADWAY
RD
MARQUETTE
FOSS ST
PARK AVE
SHERIDAN
22nd ST
4
ZONE AE
NEIL LN
COMMONWEALTH
GREENFIELD
ALLEN LN
JOINS PANEL 0190
Lake County
Unincorporated Areas
170357
12

NATIONAL FLOOD INSURANCE PROGRAM

FIRM
FLOOD INSURANCE RATE MAP

LAKE COUNTY,
ILLINOIS
AND INCORPORATED AREAS

PANEL 190 OF 295

(SEE MAP INDEX FOR PANELS NOT PRINTED)

CONTAINS:

COMMUNITY	NUMBER	PANEL	SUFFIX
LAKE BLUFF, VILLAGE OF	170373	0190	F
LAKE COUNTY	170357	0190	F
LAKE FOREST, CITY OF	170374	0190	F
NORTH CHICAGO, CITY OF	170384	0190	F

Notice to User: The MAP NUMBER shown below should be used when placing map orders; the COMMUNITY NUMBER shown above should be used on insurance applications for the subject community.

MAP NUMBER
17097C0190 F

EFFECTIVE DATE:
SEPTEMBER 3, 1997

Federal Emergency Management Agency

(1)

87° 48' 45"

42° 18' 45"

LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100–YEAR FLOOD

ZONE A No base flood elevations determined.

ZONE AE Base flood elevations determined.

ZONE AH Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.

ZONE AO Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.

ZONE A99 To be protected from 100–year flood by Federal flood protection system under construction; no base flood elevations determined.

ZONE V Coastal flood with velocity hazard (wave action); no base flood elevations determined.

ZONE VE Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

ZONE X Areas of 500–year flood; areas of 100–year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100–year flood.

OTHER AREAS

ZONE X Areas determined to be outside 500–year floodplain.

ZONE D Areas in which flood hazards are undetermined.

UNDEVELOPED COASTAL BARRIERS*

Identified 1983

Identified 1990 or Later

Otherwise Protected Areas Identified 1991 or Later

2

*Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

Floodplain Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet**

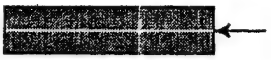
A — A — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone**

RM7 X — Elevation Reference Mark

• M1.5 — River Mile

*Coastal barrier areas are normally located within or adjacent to Special Flood Hazard Areas.

———————	Floodplain Boundary
— — — — — —	Floodway Boundary
- ——— ——— -	Zone D Boundary
	Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.
~~ 513 ~~~~	Base Flood Elevation Line; Elevation in Feet**
	Cross Section Line
(EL 987)	Base Flood Elevation in Feet Where Uniform Within Zone**
RM7 X	Elevation Reference Mark
● M1.5	River Mile

**Referenced to the National Geodetic Vertical Datum of 1929

MAP REPOSITORY

Refer to Repository Listing on Map Index

EFFECTIVE DATE OF COUNTYWIDE
FLOOD INSURANCE RATE MAP

SEPTEMBER 3, 1997

EFFECTIVE DATE(S) OF REVISION(S) TO THIS PANEL

Refer to the FLOOD INSURANCE RATE MAP effective date shown on this map to determine when actuarial rates apply to structures in the zones where elevations or depths have been established.

To determine if flood insurance is available in this community, contact your insurance agent or call the National Flood Insurance Program at (800) 638-6620.

3

APPROXIMATE SCALE

1000 0 1000 FEET

'48' 45"

42° 18' 45"

NOTES TO USERS

This map is for use in administering the National Flood Insurance Program; it does not necessarily identify all areas subject to flooding, particularly from local drainage sources of small size, or all planimetric features outside Special Flood Hazard Areas. The community map repository should be consulted for possible updated flood hazard information prior to use of this map for property purchase or construction purposes.

Coastal base flood elevations apply only landward of 0.0' National Geodetic Vertical Datum of 1929 (NGVD), and include the effects of wave action; these elevations may also differ significantly from those developed by the National Weather Service for hurricane evacuation planning.

Areas of special flood hazard (100-year flood) include Zones A, AE, AH, AO, A99, V, and VE.

Certain areas not in Special Flood Hazard Areas may be protected by flood control structures.

Boundaries of the floodways were computed at cross sections and interpolated between cross sections. The floodways were based on hydraulic considerations with regard to requirements of the Federal Emergency Management Agency.

Floodway widths in some areas may be too narrow to show to scale. Floodway widths are provided in the Flood Insurance Study Report.

Corporate limits shown on this map are based on the best data available. The user should contact appropriate community officials to verify the corporate limit delineations shown on this map.

For community map revision history prior to countywide mapping, see section 6.0 of the Flood Insurance Study Report.

For adjoining map panels see separately printed Map Index.

DIGITAL DATA AVAILABILITY: Digital files containing the thematic floodplain information shown on these maps are published by the Federal Emergency Management Agency in DLG-3 Optional format on CD-ROM. Requests for data should include the full name of the community or county and the Flood Insurance Rate Map panel numbers covered by the request. Contact the Federal Emergency Management Agency, Map Service Center, 6730 Santa Barbara Court, Baltimore, Maryland 21227-5832. Telephone 1-800-358-9616.

NOTE: The coordinate system used for the production of this Flood Insurance Rate Map (FIRM) is Universal Transverse Mercator (UTM), North American Datum of 1927 (NAD27), Clarke 1866 spheroid. Corner coordinates shown on the FIRM are in latitude and longitude referenced to the Universal Transverse Mercator projection, NAD27. Differences in the datum and spheroid used in the production of FIRMs for adjacent counties may result in slight positional differences in map features at the county boundaries. These differences do not affect the accuracy of the information shown on the FIRM.

ATTENTION: Flood elevations on this map are referenced to the National Geodetic Vertical Datum of 1929. These flood elevations must be compared to structure and ground elevations referenced to the same datum. For information regarding conversion between the National Geodetic Vertical Datum of 1929 and the North American Vertical Datum of 1988, contact the National Geodetic Survey at the following address:

Vertical Network Branch, N/CG13
National Geodetic Survey, NOAA
Silver Spring Metro Center 3
1315 East-West Highway
Silver Spring, Maryland 20910
(301) 713-3191

BASE MAP SOURCE: Planimetric base map information files were provided by Lake County, Illinois, Department of Management Services. These files were compiled at a scale of 1" = 200' from orthophotographs dated 1984 to 1986.

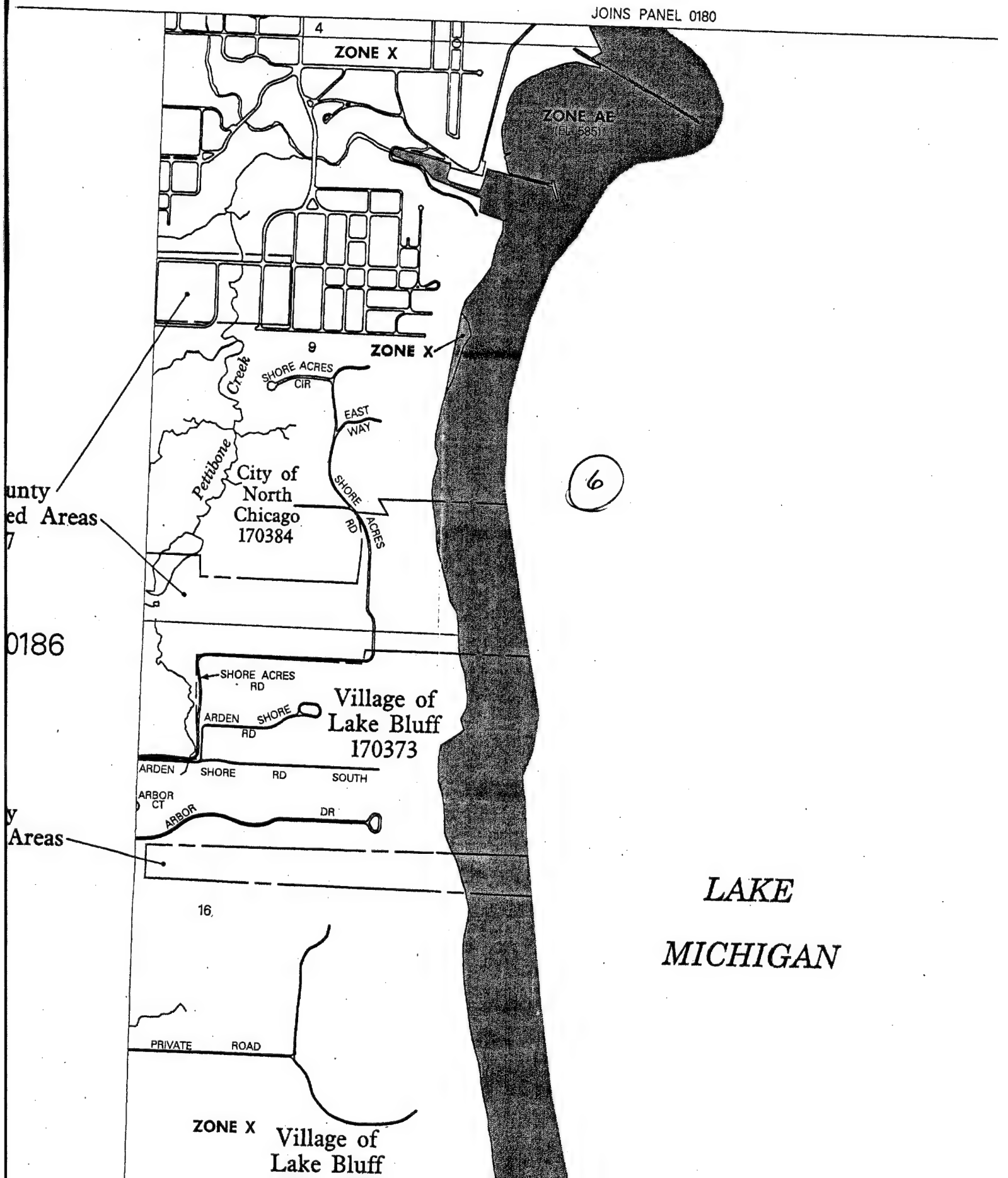
87°50' 37.5"
42° 18' 45"

Lake County
Unincorporated Area
170357

THIS AREA SHOWN ON MAP NUMBER 17097C0186

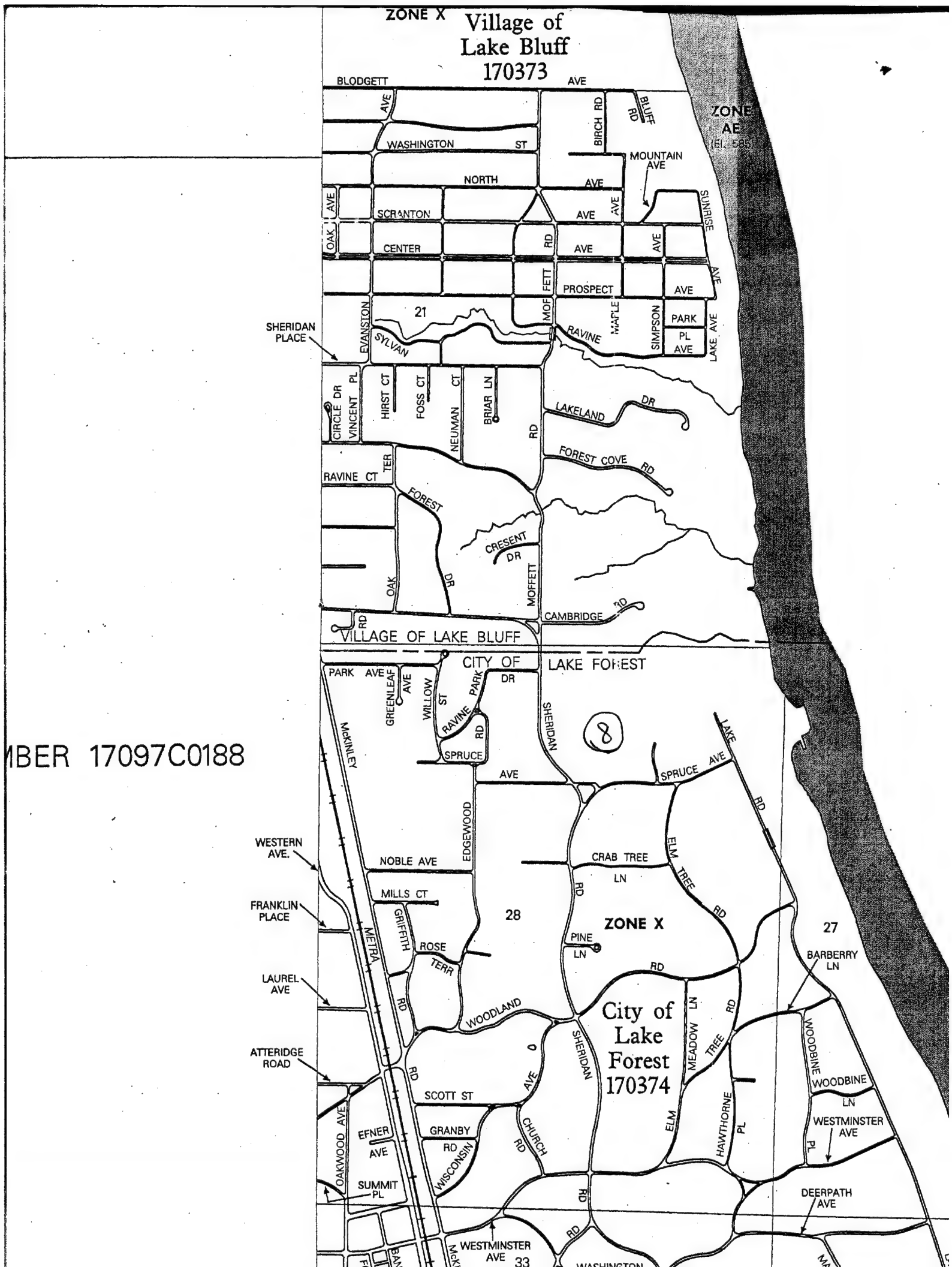
(5)

Lake County
Unincorporated Areas
170357


JOINS PANEL 0180
4
ZONE X
ZONE AE
(EL 585)
9
ZONE X
SHORE ACRES CIR
EAST WAY
Pettibone Creek
City of North Chicago 170384
SHORE ACRES RD
6
unty
ed Areas
7
0186
SHORE ACRES RD
ARDEN SHORE RD
Village of Lake Bluff 170373
ARDEN SHORE RD SOUTH
ARBOR CT
ARBOR DR
y
Areas
16
LAKE
MICHIGAN
PRIVATE ROAD
ZONE X
Village of Lake Bluff

THIS AREA SHOWN ON MAP NUMBER 17097C0188

(7)



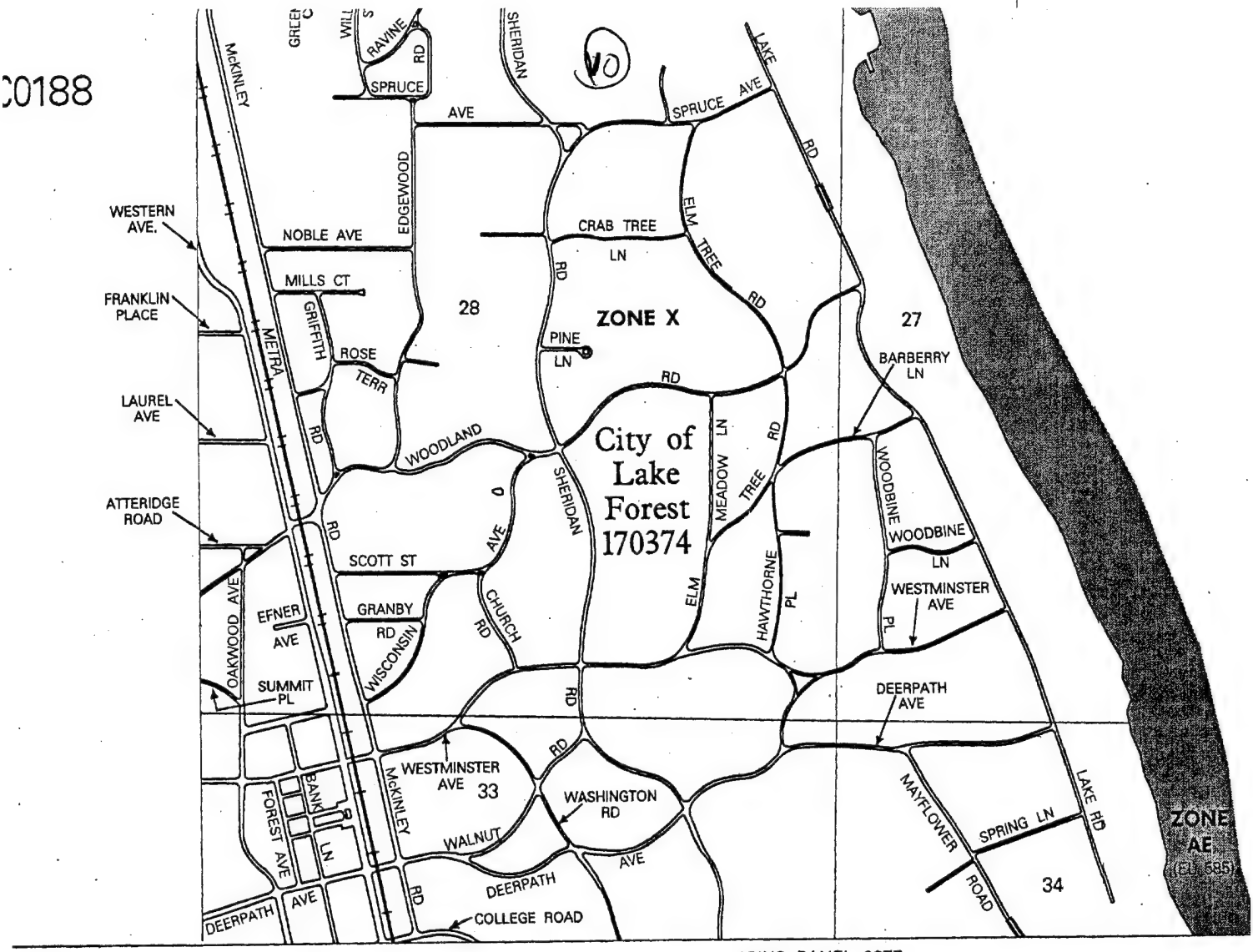
MBER 17097C0188

THIS AREA SHOWN ON MAP NUMBER 17097C0

(9)

42° 15' 00"
87° 52' 30"

:0188


City of Lake Forest 170374
ZONE X
ZONE AE
(EL 585)
28
27
33
34
WESTERN AVE.
FRANKLIN PLACE
LAUREL AVE
ATTERIDGE ROAD
NOBLE AVE
MILLS CT
GRIFFITH
ROSE TERR
WOODLAND
SCOTT ST
EFNER AVE
GRANBY
SUMMIT PL
OAKWOOD AVE
WISCONSIN
CHURCH RD
SHERIDAN
EDGEWOOD
RAVINE RD
SPRUCE AVE
CRAB TREE LN
PINE LN
ELM TREE RD
MEADOW LN
HAWTHORNE PL
ELM
BARBERRY LN
WOODBINE LN
WESTMINSTER AVE
DEERPATH AVE
WASHINGTON RD
WALNUT
WESTMINSTER AVE
FOREST AVE
BANK LN
DEERPATH AVE
COLLEGE ROAD
MAYFLOWER ROAD
SPRING LN
LAKE RD
METRA
McKINLEY
JOINS PANEL 0277

Appendix J

Agency Correspondence

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION V
77 West Jackson Boulevard
Chicago, IL 60604

Date: 1/7/03

Document: ENVIRONMENTAL ASSESSMENT (EA) FOR CONSTRUCTION OF COGENERATION POWER STATION AND FUEL OIL CONVERSION PROJECTS (COPY ATTACHED)

Dear Interested Party:

The Environmental Planning and Evaluation Branch has received the document listed above. Under the National Environmental Policy Act (NEPA), the Council on Environmental Quality regulations, and Section 309 of the Clean Air Act; U.S. EPA reviews and comments on major federal actions. Typically, these reviews focus on Environmental Impact Statements, but we also have the discretion to review and comment on other environmental documents prepared under NEPA if interest and resources permit.

We did not undertake a detailed review of the document you sent to this office, and will not be generating comments because of the reason selected below.

_____ The document was not prepared under NEPA.
_____ The document was given a cursory review, but other workload priorities precluded us from undertaking a detailed review and generating comments.
_____ The document was given a cursory review, and we determined that there were no significant concerns meriting comment.
✓ We opted to wait for the next level of documentation on this project before deciding whether or not to comment.

We reserve the right to reconsider undertaking a review at future planning stages, or if significant new data on the project is made available by the sponsoring agency or other interested parties. Thank you for providing information on the project.

Sincerely,

Kenneth A. Westlake, Chief
Environmental Planning and Evaluation Branch

ILLINOIS
DEPARTMENT OF
NATURAL RESOURCES
Office of Water Resources
310 South Michigan Avenue, Room 1606, Chicago 60604 George H. Ryan, Governor ● Brent Manning, Director

January 13, 2003

Mr. Mark Schultz, Environmental Director
Department of the Army
Navy Public Works Center
Building 1A
201 Decatur Avenue
Great Lakes, Illinois 60088-2801

Dear Mr. Schultz:

Your letter dated December 17, 2002 to Mr. Gary Jereb in our Bartlett office has been forwarded to me for response.

The Department's Chicago office is responsible for issuing permits for any construction activities in and along Lake Michigan. If your project involves any work in Lake Michigan, you will need to obtain a permit from our office. In addition, we also manage Illinois' diversion of water from Lake Michigan as allowed under a U.S. Supreme Court Decree. As a federal facility, Great Lakes Naval Training Center is not required to obtain a Lake Michigan water allocation permit from the Department. We will, however, need to know how much Lake Michigan water is withdrawn and how it is used in the facility so that proper accounting of your water use can be incorporated in the Corps of Engineers' diversion accounting system.

By copy of this letter, I am forwarding your letter to Mr. Stephen Davis, Division Manager in the Department's Office of Realty and Environmental Planning. His office is responsible for reviewing impacts to threatened and endangered species and the other issues you plan to address in your EA. If you wish to contact him directly, he can be reached at:

Mr. Stephen Davis, Division Manager
Office of Realty and Environmental Planning/Resource Review and Coordination
Illinois Department of Natural Resources
One Natural Resources Way
Springfield, IL 62702-1271 217-557-0877.

If you have any questions or would like to discuss your project and our permit requirements in greater detail, please feel free to contact me at 312/793-3123.

Very truly yours,

Daniel Injerd, Chief
Lake Michigan Management Section

DI:cp
cc: Stephen Davis

ILLINOIS ENVIRONMENTAL PROTECTION AGENCY

1021 NORTH GRAND AVENUE EAST, P.O. BOX 19276, SPRINGFIELD, ILLINOIS 62794-9276
JAMES R. THOMPSON CENTER, 100 WEST RANDOLPH, SUITE 11-300, CHICAGO, IL 60601

ROD R. BLAGOJEVICH, GOVERNOR RENEE CIPRIANO, DIRECTOR

217/782-0547

February 7, 2003

Mr. Mark Schultz
Environmental Director
Department of the Navy
Navy Public Works Center and
Engineering Field Activity Midwest
Building 1A
201 Decatur Avenue
Great Lakes, Illinois 60088-2801

Re: Environmental Assessment (EA) for Construction of
Cogeneration Power Station and Fuel Oil Conversion Projects

Dear Mr. Schultz:

Thank you for the opportunity to comment on the Environmental Assessment for the proposed Cogeneration Power Station and Fuel Oil Conversion projects at the Naval Station Great Lakes.

The Agency has no objections to the project; however, a permit will be required from the Division of Water Pollution Control, if this project involves a discharge of wastewater to the sanitary sewer or surface water (waters of the State). This project may also require stormwater (NPDES) permits. Please contact Alan Keller at 217/782-0610 for specific permit requirements.

Insufficient information was submitted to determine if a construction permit for water main construction is necessary from the Division of Public Water Supplies. Please contact Jerry Kuhn at 217/782-9470 for permit requirements for public water supplies.

The project will also require a permit from the Bureau of Air. A permit application to construct two turbines and two backup generators was received by the Bureau of Air on November 18, 2002. Please contact Bob Bernoteit at 217/782-2113 if further information is required regarding the air permits.

Sincerely,

Bernard P. Killian

Bernard P. Killian
Deputy Director

Illinois Historic
Preservation Agency

1 Old State Capitol Plaza • Springfield, Illinois 62701-1507 • (217) 782-4836 • TTY (217) 524-7128

Lake County
Great Lakes NTC
Cogeneration Power Station and Fuel Oil Conversion, New Construction
Porter Ave. Power Plant
IHPA LOG #0212230017W-L

January 23, 2003

Mark Schultz
Department of the Navy
Navy Public Works Center
Building 1A
201 Decatur Ave.
Great Lakes, IL 60088-2801

Dear Mr. Schultz:

Thank you for requesting comments from our office concerning the possible effects of your project on cultural resources. Our comments are required by Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800: "Protection of Historic Properties".

Our staff has reviewed the specifications of the referenced project as submitted by your office. This property is a contributing structure to the Great Lakes Naval Training Station, which was listed on the National Register of Historic Places on September 15, 1986. We cannot adequately review this proposed project until the following additional documentation has been submitted to our Agency:

Project plans and specifications for proposed undertaking.

In your reply, please refer to IHPA Log #0212230017W-L. If you have any further questions, please contact Cody Wright, Cultural Resource Manager, Illinois Historic Preservation Agency, 1 Old State Capitol Plaza, Springfield, IL 62701, 217/785-3977.

Sincerely,

A. E. Haaker

Anne E. Haaker
Deputy State Historic
Preservation Officer

AEH:CW:ly

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Chicago Ecological Services Field Office
1250 South Grove Avenue, Suite 103
Barrington, Illinois 60010
Phone: (847) 381-2253 Fax: (847) 381-2285

IN REPLY REFER TO:
FWS/AES-CIFO/T332

January 2, 2003

Mr. Mark Schultz
Environmental Director
Navy Public Works Center
201 Decatur Avenue, Building 1-A
Great Lakes, Illinois 60088-2801

Dear Mr. Schultz:

This responds to your scoping letter dated December 17, 2002 requesting comment on your preparation of an Environmental Assessment (EA) for construction of a Cogeneration Plant and equipment upgrades to allow fuel conversion efforts proposed to take place at Great Lakes Naval Training Center, Lake County, Illinois.

The scoping letter indicates that the environmental assessment will evaluate potential impacts and address issues related to impacts to terrestrial and aquatic resources, including wetlands, plant communities, wildlife, and endangered species. It also appears to indicate that new construction will take place within, or will be co-located with existing structures and infrastructures. Based on that, we do not foresee the proposed project having any significant impacts to aquatic resources.

Please note that the proposed project is located adjacent to an area of considerable importance as habitat for migratory birds. The breakwater area immediately southeast of the proposed dredging includes a sand island (commonly referred to by Navy staff as "Bird Island") which in recent years has supported a nesting colony of terns, and is one of the only nesting localities in Illinois for common terns (*Sterna hirundo*) and Forster's terns (*Sterna forsteri*). Also, Bird Island and adjacent panne community is used on occasion by migrating individuals of the federally endangered Great Lakes population of the piping plover (*Charadrius melodus*). Although the piping plover does not currently nest in northeast Illinois, an area north of GLNTC has been designated as Critical Habitat for this species. The EA will need to include an effects determination for endangered and threatened species. We recommend that the effects

Primary Constituent Elements (PCE's) of Piping Plover Critical Habitat[1]

(1) Sand, gravel (stones <0.4 in. [1 cm]) or cobble (stones >0.4 in. [1 cm]) beaches or spits.
(2) Areas of shoreline length >0.12 mi. (0.2 km) of gently sloping sand beach.
(3) At least 6 acres (2 ha) of sand beach.
(4) Areas of at least 164 ft. (50 m) in length where the beach width is >23 ft. (>7 m) where there is protective cover for nests and chicks, and the distance of the treeline is more than 50m.
(5) Sparsely vegetated with less than 50% herbaceous and low woody cover.
(6) Protective cover consisting of small herbaceous patches, cobble, gravel, or debris.
(7) Low level of disturbance from human activities and from domestic animals.
(8) Dynamic ecological processes that create and maintain piping plover habitat including erosion, accretion, plant succession and lake level fluctuations.

Reference:

U.S. Fish and Wildlife Service. 2001. Endangered and Threatened Wildlife: Final determination of critical habitat for the Great Lakes breeding population of the piping plover. Federal register 66(88):22938-22969.

Also available online in Adobe Acrobat Format at:
http://midwest.fws.gov/endangered/pipingplover/final_rule.pdf